

**Spring 2025**

**Communication 2596: Communicating Science, Health,  
Environment, and Risk**

**Classroom location and meeting times:** Journalism Bldg 270, Wed & Fri 12:45 to 2:05

**Instructor:** Dr. Graham Dixon

**Office location:** Derby Hall 3045A

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**Office Hours:** Wednesdays 2:30 to 4:00pm

Format of Instruction: In-Person Lecture; 3 hours/week

**Course Description**

This course provides a general introduction to the fields of science, risk, environmental and health communication from multiple perspectives including psychological, social, cultural, and behavioral sciences. Students will apply theories and research covered in class to address real-world challenges of communicating science, health, environment, and risk to wide audiences.

As a GE sustainability-themed course, instruction will focus on the fundamental dependence of humans on earth and environmental systems and address aspects of the interdependence of human and natural systems. This includes exploring the role of communication in the formation of people's attitudes and beliefs toward several dimensions of sustainability, including environmental and earth systems; economy and governance; society and culture; engineering, technology and design; and health and well-being. As such, this course examines the continually evolving information environment and how it impacts our conceptualization of and approach toward sustainability within the context of the environment, scientific technology, health, and risk.

More specifically, this course involves deep engagement-with issues central to sustainability dimensions such as climate change (e.g., environmental and earth systems), vaccination (e.g., health and wellbeing), genetically modified foods (e.g., society and culture), and transportation technology (e.g., engineering, technology, and design). While many of the topics we discuss are controversial and polarizing, the purpose of the course is to understand the communication processes and effects behind these topics. For example, we address why so many sustainability topics become controversial; what role do cultural and political values play in polarizing people's views; and how do communication interventions impact people's views on various dimensions of sustainability?

Rather than advocate for a particular position, our goal is to explore these topics through an objective lens as academic observers.

Content from this course benefits students with an interest in a variety of careers, including public policy, public health, communication research, advertising, science education, and public relations, to name a few.

**GE category:** Sustainability Theme

### **Sustainability Theme Goals**

1. Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.
2. Successful students will integrate approaches to sustainability by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in the future.
3. Students will analyze and explain how social and natural systems function, interact, and evolve over time; how human wellbeing depends on these interactions; how actions have impacts on subsequent generations and societies globally; and how human values, behaviors, and institutions impact multi-faceted, potential solutions across time.

### **Sustainability Theme Expected Learning Outcomes**

1. Students will engage in critical and logical thinking about sustainability.
  - a. Readings, lectures, and in-class activities provide opportunities for critical thinking towards sustainability dimension, including how actions have impacts on subsequent generations and societies globally; and how human values, behaviors, and institutions impact multi-faceted, potential solutions across time.
2. Students will engage in an advanced, in-depth, scholarly exploration of sustainability.
  - a. In-class discussion and activities provide opportunity for in-depth, scholarly exploration of sustainability dimensions
3. Students will identify, describe, and synthesize approaches or experiences as they apply to sustainability.
  - a. In-class discussion with an emphasis on real-world application will be used to identify, describe, and synthesize approaches/experiences to sustainability (e.g., climate change adaptation).
4. Students will demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.
  - a. In-class discussion and activities provide opportunities for students to demonstrate their creative work and generating a sense of self as a learner.
5. Students will describe elements of the fundamental dependence of humans on Earth and environmental systems and on the resilience of these systems.
  - a. In-class discussion and paper assignments will provide opportunities for students to assess elements of fundamental dependence of humans on environmental systems.

6. Students will describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, currently, and in the future.
  - a. Instruction includes assessing the communication of topics related to human activity and technology on society and the natural world, including climate change, GMO foods, autonomous vehicles, and vaccination.
7. Students will devise informed and meaningful responses to problems and arguments in the area of sustainability based on the interpretation of appropriate evidence and an explicit statement of values.
  - a. Assignments and in-class discussion regarding problems and arguments around the communication of sustainability dimensions are used heavily in this course.

Legacy General Education Goals and ELOs

### Goals

Students demonstrate an understanding of a topic of interest through scholarly activities that draw upon multiple disciplines and through their interactions with students from different majors.

### Expected Learning Outcomes

- Students understand the benefits and limitations of different disciplinary perspectives.
- Students understand the benefits of synthesizing multiple disciplinary perspectives.
- Students synthesize and apply knowledge from diverse disciplines to a topic of interest

### Grading

Assignments	% of Final Grade
Movie Review	20%
In-Class Assignments	20%
Exam I	30%
Exam II	30%
Final Exam	30%

\*lowest exam score is dropped\*

**A** = 93-100; **A-** = 90-92; **B+** = 87-89; **B** = 83-86; **B-** = 80-82; **C+** = 77-79; **C** = 73-76; **C-** = 70-72; **D+** = 67-69; **D** = 60-66; **E** = Below 60

### Assignments and Exams

**Required Readings.** There is no textbook for this course. Instead, PDFs of selected chapters and articles will be posted on Carmen for each class – refer to the course schedule on Carmen for

each day's assigned readings. Students are expected to complete all readings prior to class so that they will be prepared to discuss the material in class. If any student is interested in additional readings on the assigned or related topics, please feel free to contact me and I can suggest additional resources.

**In-class activity assignments.** Throughout the semester, I will stop lecturing and pass out in class assignments. Some assignments will involve solo work with class discussion; other times I will break the class up into groups. You will be graded on your participation and completion of the assignment. There will be ten in-class assignments in total and they will occur without prior announcement. I will excuse one missed in-class assignment. Because of this, no make-ups are allowed. These assignments help illustrate role of communication in the formation of people's attitudes and beliefs toward several dimensions of sustainability, including environmental and earth systems; economy and governance; society and culture; engineering, technology and design; and health and well-being.

**Movie Review.** Students will conduct an academic review of a science and sustainability-based film from a list of approved films (e.g., *The Day After Tomorrow*). Specifically, students will apply theories and concepts learned in class when assessing their chosen film. Importantly, this is a fun assignment that gets students thinking more deeply about how popular films/entertainment might impact public understanding of science, perceptions of sustainability, and policy stances. The paper will be between 5-6 pages double spaced, not including references. You will turn in your paper digitally through Carmen.

**Exams.** You have three online exams in this course. However, I drop your lowest score. This means that if you do well on the first two exams, you can skip the final exam. Also, if you miss one exam, then that will be treated as your dropped exam. Because of this policy, I do not allow makeup exams. All exams will be assessed with multiple choice, fill in the blank, and short answer questions. Access to exams will be for a 12 hour period on a specific date (see course schedule). The first exam covers our science and environmental sections; the second exam covers our health and risk sections. The final is cumulative, covering all material taught in class. Students are given 80 minutes to complete the exam. All exams are open book and are administered on the course's Carmen site.

All exams cover in-class material as well as content from your readings. To do well in this course means you will need to read every assigned reading.

### Course Policies

**Mutual Respect.** Students in this class come from a variety of personal, political, and academic backgrounds, so realize that there will be different perspectives. Your responsibility is to be civil to others and to opinions that differ from yours.

**Technology use and General Politeness.** Technology (phones, laptops, etc) use for non-class related reasons can be very distracting for the professor and for classmates. You're paying a lot of money for this course, so don't waste it on Facebook and texting with friends that you'll see later in the day. The professor reserves the right to take off grade points for repeat offenders.

**Professor and Teaching Assistant's Use of Electronic Mail and Messaging.** There may be occasions where I will need to get in touch with you outside of regular class hours. Email will usually be the first means by which contact will be initiated. It is important that you check your OSU email account regularly, and make sure you purge your account of unneeded email so that new email can get through. If you do not use your OSU email address as your primary email account, please arrange through OIT to have your OSU email forwarded to your preferred account. For instructions on how to have your email forwarded, see [http://8help.osu.edu/forms/mail\\_forwarding.html](http://8help.osu.edu/forms/mail_forwarding.html).

**Academic Misconduct.** It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>."

All instances of cheating and plagiarism will be reported to COAM for a formal hearing. Please do not cheat or plagiarize. Maximum grade penalty is failing the entire course.

**Statement about disability services.** The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

**Religious Accommodations:** It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief. Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed

**Diversity.** The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global

economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

**Mental Health Statement:** As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting [ccs.osu.edu](http://ccs.osu.edu) or calling [614-292-5766](tel:614-292-5766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:614-292-5766) and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).

**Title IX.** Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu)

**COVID-19 Accommodations.** The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's [request process](#), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

## Course Schedule (Tentative)

Week	Week Overview	Readings/Major Assignments
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1	Introduction to the course (1/08)  What is Science Communication? (1/10)	Burns et al. (2003)  Brossard & Scheufele (2013)
2	The (counter)norms of scientists (1/15)  Public perception of scientists (1/17)	Mitroff (1974)  Suldovsky et al. (2019) Pew Research Report (2019)
3	Public understanding of science (1/22)  Entertainment media and science (1/24)	Bullock et al. (2019) Funk & Goo (2015) Landrum et al. (2021)  Leiserowitz (2004)
4	News reporting on science: (1/29)  Framing, agenda setting, and cultivation theory (1/31)	Boykoff & Boykoff (2004)  Hart et al. (2020) Rickard et al. (2021)
5	Science “denialism” :Exploring climate change skepticism, flat earth movement, anti-vaccination, and others (2/5)  Science communication persuasion (2/7)	Pennycook et al. (2020)  Hart & Nisbet (2012) Nisbet et al., (2015) Basol et al., (2020)
6	Environmental communication introduction (2/12)  Environmental values (2/14)	Feinberg & Willer (2013)  McCright et al. (2013) Lewis (2000)  Watch: Graveyard Slums
7	Environmental organizations (2/19)  Green marketing (2/21)	Schuldt (2013)
8	Environmental campaigns (2/26)  <b>Online exam day - No in person class (2/28)</b>	Dixon et al. (2015)  <b>Exam 1 link available on 2/28 from 8am to 8pm EST</b>
9	Risk perception (3/5)  Risk and Rationality part 1 (3/7)	McComas (2006)  Slovic (1987)

<b>10</b>	<b>Spring Break</b>	
<b>11</b>	Risk and Rationality part 2 (3/19)  Risk perception of emerging technology (3/21)	Kahneman (2011)  Lindenfeld et al (2014)
<b>12</b>	Communicating risks (3/26)  Health communication: why is it necessary? (3/28)	Watch conflicts of sustainability technology
<b>13</b>	Public Health Campaigns; Digital health, Virtual reality (4/2)  Digital health, Social Media (4/4)	Drope & Chapman (2001)  <b>Movie Review Due by 4/02, 11:59PM Eastern time, on Carmen</b>  Byrne et al. (2019)
<b>14</b>	Health controversies, vaccines (4/9)  Health controversies, Covid-19 (4/11)	Nowak et al. (2020)  Islam et al. (2020)
<b>15</b>	Health controversies, mis/disinformation (4/16)  <b>Online exam day - No in person class (4/18)</b>	Nyhan et al. (2014)  <b>Exam 2 link available on 4/18 from 8am to 8pm EST</b>
<b>Final Exam</b>	Thursday, 4/24	<b>Final exam link available Thursday Apr 24 , 8am to 8pm EST.</b>

### Reading List

Basol, M., Roozenbeek, J., & Van der Linden, S. (2020). Good news about bad news: Gamified inoculation boosts confidence and cognitive immunity against fake news. *Journal of cognition*, 3(1).

Burns, T. W., O'Connor, D. J., & Stocklmayer, S. M. (2003). Science communication: a contemporary definition. *Public understanding of science*, 12(2), 183-202.

Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: Global warming and the US prestige press. *Global environmental change*, 14(2), 125-136.

Brossard, D., & Scheufele, D. A. (2013). Science, new media, and the public. *Science*, 339(6115), 40-41.



- Bullock, O. M., Colón Amill, D., Shulman, H. C., & Dixon, G. N. (2019). Jargon as a barrier to effective science communication: Evidence from metacognition. *Public Understanding of Science*, 28(7), 845-853.
- Byrne, S., Greiner Safi, A., Kemp, D., Skurka, C., Davydova, J., Scolere, L., ... & Niederdeppe, J. (2019). Effects of varying color, imagery, and text of cigarette package warning labels among socioeconomically disadvantaged middle school youth and adult smokers. *Health Communication*, 34(3), 306-316.
- Dixon, G. N., Deline, M. B., McComas, K., Chambliss, L., & Hoffmann, M. (2015). Using comparative feedback to influence workplace energy conservation: A case study of a university campaign. *Environment and Behavior*, 47(6), 667-693.
- Drope, J., & Chapman, S. (2001). Tobacco industry efforts at discrediting scientific knowledge of environmental tobacco smoke: a review of internal industry documents. *Journal of Epidemiology & Community Health*, 55(8), 588-594.
- Feinberg, M., & Willer, R. (2013). The moral roots of environmental attitudes. *Psychological science*, 24(1), 56-62.
- Funk, C., & Goo, S. K. (2015). A look at what the public knows and does not know about science. Pew Research
- Hart, P. S., & Nisbet, E. C. (2012). Boomerang effects in science communication: How motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication research*, 39(6), 701-723.
- Hart, P. S., Chinn, S., & Soroka, S. (2020). Politicization and polarization in COVID-19 news coverage. *Science Communication*, 42(5), 679-697.
- Islam, M. S., Sarkar, T., Khan, S. H., Kamal, A. H. M., Hasan, S. M., Kabir, A., ... & Seale, H. (2020). COVID-19–related infodemic and its impact on public health: A global social media analysis. *The American journal of tropical medicine and hygiene*, 103(4), 1621.
- Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- Landrum, A. R., Olshansky, A., & Richards, O. (2021). Differential susceptibility to misleading flat earth arguments on youtube. *Media Psychology*, 24(1), 136-165.
- Leiserowitz, A. A. (2004). Day after tomorrow: study of climate change risk perception. *Environment: Science and Policy for Sustainable Development*, 46(9), 22-39.
- Lewis, T. L. (2000). Media representations of “sustainable development” sustaining the status quo?. *Science Communication*, 21(3), 244-273.
- Lindenfeld, L. A., Hall, D. M., McGreavy, B., Silka, L., & Hart, D. (2012). Creating a place for environmental communication research in sustainability science. *Environmental Communication: A Journal of Nature and Culture*, 6(1), 23-43.

- Lindenfeld, L., Smith, H. M., Norton, T., & Grecu, N. C. (2014). Risk communication and sustainability science: lessons from the field. *Sustainability science*, 9(2), 119-127.
- Mitroff, I. I. (1974). Norms and counter-norms in a select group of the Apollo moon scientists: A case study of the ambivalence of scientists. *American Sociological Review*, vol 579-595.
- McCright, A. M., Dentzman, K., Charters, M., & Dietz, T. (2013). The influence of political ideology on trust in science. *Environmental Research Letters*, 8(4), 044029.
- McComas, K. A. (2006). Defining moments in risk communication research: 1996–2005. *Journal of Health Communication*, 11(1), 75-91.
- Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis) trust science. *The ANNALS of the American Academy of Political and Social Science*, 658(1), 36-66.
- Nowak, G. J., Evans, N. J., Wojdynski, B. W., Ahn, S. J. G., Len-Rios, M. E., Carera, K., ... & McFalls, D. (2020). Using immersive virtual reality to improve the beliefs and intentions of influenza vaccine avoidant 18-to-49-year-olds: Considerations, effects, and lessons learned. *Vaccine*, 38(5), 1225-1233.
- Nyhan, B., Reifler, J., Richey, S., & Freed, G. L. (2014). Effective messages in vaccine promotion: a randomized trial. *Pediatrics*, 133(4), e835-e842.
- Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G., & Rand, D. G. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy-nudge intervention. *Psychological science*, 31(7), 770-780.
- Rickard, L. N., Yang, J. Z., Liu, S., & Boze, T. (2021). Fish tales: How narrative modality, emotion, and transportation influence support for sustainable aquaculture. *Science Communication*, 43(2), 252-275.
- Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280-285.
- Suldovsky, B., Landrum, A., & Stroud, N. J. (2019). Public perceptions of who counts as a scientist for controversial science. *Public Understanding of Science*, 28(7), 797-811.
- Schuldt, J. P. (2013). Does green mean healthy? Nutrition label color affects perceptions of healthfulness. *Health Communication*, 28(8), 814-821.