Instructor
Professor Bruce Lewenstein
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http://lewenstein.comm.cornell.edu (web)
Office hours: Weds, 11:15-1:00,
or happily by appointment

TAs
Gina Eosco (gme7@cornell.edu)
Hepeng Jia (hj352@cornell.edu)
Office hours: TBA

Time and location
Class: MWF 10:10—11:00, Malott 253

Additional class information and readings are available on the class website on Blackboard.
Last update: 21 January 2014

Course goals and format
Scientific research...environmental issues...public health...food risks...science museum displays. In each of these areas, communication plays a fundamental role. From the media to individual conversations with doctors, from technical journals to textbooks to bestsellers, from lab notes to blogs to Twitter, communication helps define individual scientific problems, social issues and research findings. We will examine the institutional and intellectual contexts, processes, and practical constraints on communication in environment, science, and health (CESH).

Put more formally, this course has the following objectives. As students, you will learn to:

- Identify the role of communication in all aspects of science (including health, medicine, scientific research, environmental issues, etc.)
- Identify theories of science communication
- Identify connections between theories of science communication and theories in fields such as general communication, science & technology studies, sociology, psychology, etc.
- Identify institutional constraints on science communication
- Identify practical constraints on science communication
- Become aware of career opportunities in science communication

To accomplish these goals, we will look at many examples of communication in environment, science, and health. We will read academic analyses of CESH (indeed, learning to read academic articles is an important sub-goal for being able to accomplish the objectives listed above), and most of our class discussions will be devoted to these readings. A class blog, in-class writing, and short papers will give you a chance to comment on and analyze science communication.

This course is fundamentally one in which you as students will explore these issues; my role, as instructor, is to guide the discussion. Thus you should expect to read, write, and talk (either face-to-face or via online forums) a lot in this course. That’s true even though it’s a big “lecture” class – we’ll try to facilitate interaction.
Assignments and grades (also known as "assessments")
Assessment in this course will be based on written material – both short papers and an online discussion board. Several of the papers will depend on being in class on a specific day, as the papers will be responses to class activities on those days. There will be no final exam or final paper, but there will be an optional final paper for extra credit. Be aware that some of the specific due dates below may change as the course evolves over the semester; the Blackboard site will have updated information.

The assessments will be:

- **Short papers**: 4, for 20% each
- **Discussion board postings**: 20%
  - Weekly (of which, you should initiate at least 3 threads during the semester)
- **OPTIONAL EXTRA CREDIT**:
  - Optional final paper; maximum 5% addition
  - Communication Department experiment participation pool; maximum 2% addition
    - Sign up at https://cornell-comm.sona-systems.com (be sure to use this address, as there are other SONA systems on campus)
    - 1 SONA point credit adds 0.5% extra credit

**Rules**
I don't have many rules. But not following the ones I do have can have serious consequences, up through failing the course.

- You are responsible for information distributed in class and updated on the class online Blackboard site.
- Be alert. Contribute to class.
- Any written assignments except those done in class need to be typed, double-spaced, using normal type-fonts (Times Roman, 12 point, is always a good choice) and normal margins (1 inch all around is a good standard)
- Assignments should be submitted via Blackboard, and will be graded down for being late.
- **No plagiarizing or other cheating.** You are responsible for knowing the Cornell Code of Academic Integrity. If you're not sure what that is, or what constitutes "plagiarizing" or "cheating," explore the Code of Academic Integrity website, and feel free to ask for guidance. Students (especially those from other countries) should be aware that American academic standards of acknowledgement and use of material prepared by others (especially one's professors) can be much different than those in other national and professional cultures. More information about plagiarism is available at <http://plagiarism.arts.cornell.edu/tutorial/index.cfm>.
**Weekly schedule, readings, assignments**
The following schedule is tentative and subject to change.
Readings are on the Internet or on the password-protected class website on Blackboard

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic and readings</th>
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</table>
| 1    | 22 Jan | INTRODUCTION: COMMUNICATION IN THE SCIENCES  
What is science communication, and how will we explore it? |
|      | 24 Jan | Why communicate?  
SUPPLEMENTARY:  
Scientific journals and peer review  
- Wikipedia introductions to scientific journals [link] and peer review [link]  
| 2    | 27 Jan | CHALLENGES FOR COMMUNICATION IN THE SCIENCES  
How are new technologies reshaping science communication? |
|      | 29 Jan | Open access publishing  
Case study: Arsenic life  
### 31 Jan

#### Preprints
  - [Note: you will need to register on this site]

### GUEST SPEAKER: On Wednesday or Friday of this week we will have a guest speaker on current issues in science publishing

### 3 Feb

**CONTEXTS AND MODELS FOR SCIENCE COMMUNICATION**

- Bee-Eaters. Let's follow one example--read the material in the following order
  - BBC. (1989). *The Bee-Eaters* [Nature] [video and television script]. London: British Broadcasting Corporation. [script on Blackboard, video will be shown in class]

- What do nature films show us?

### 5 Feb

- Models of science communication. Do information flows conform to the traditional model of lab-> journal-> public? Can we use communication theory to understand what's happening?

### 7 Feb

### 4 Feb

**ENVIRONMENT: NATURE WRITING**

- Communication about the environment is first about creating attitudes toward the natural world.
And here are some classic examples:
- Selections from the writings of Aldo Leopold, author of *Sand County Almanac* [on Blackboard]

What does nature writing do for us?

**ASSESSMENT #1: IN-CLASS, Friday, 14 February**

[General topic: Where do particular examples fit in overall science communication system?]

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<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>12 Feb</td>
<td><strong>ENVIRONMENT: POLITICAL ACTION</strong></td>
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<tr>
<td>14 Feb</td>
<td><strong>NO CLASS: February break</strong></td>
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<tr>
<td>17 Feb</td>
<td><strong>CASE: GMOs (with a side of autism)</strong></td>
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</table>
| 19 Feb | **What role does communication play in public opinion about environmental issues?**

Can we find the issues identified in the readings in one environmental controversy? Let’s look at fracking.
- Cornell Cooperative Extension page [link]
- Anti-fracking: Shaleshock [link]
- Pro-fracking: Marcellus Drilling News [link]
- Environmental pro-fracking: [link]
- Corporate anti-fracking [link]
- [likely to be more sites, if New York State makes a decision by the time we get to this topic]
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<tr>
<td>24 Feb</td>
<td><strong>ENVIRONMENT AND HEALTH: RISK COMMUNICATION</strong></td>
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<tr>
<td></td>
<td>Enough research has been done on risk to know what the basic recommendations are:</td>
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<td></td>
<td>- <em>CDC Health Risk Communication Primer</em> <a href="#">link</a>, work your way through the document using links in green box on the upper left</td>
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<tr>
<td>26 Feb</td>
<td>Cultural components of risk communication</td>
</tr>
<tr>
<td>28 Feb</td>
<td>Climate change communication</td>
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<tr>
<td>7</td>
<td><strong>HEALTH COMMUNICATION: DOCTOR-PATIENT COMMUNICATION</strong></td>
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<tr>
<td>3 Mar</td>
<td>For many people, the most regular interaction they'll have with risk communication involves their personal health.</td>
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<tr>
<td>5 Mar</td>
<td>The Internet has dramatically changed health communication.</td>
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<tr>
<td>7 Mar</td>
<td><strong>ASSESSMENT #2: In-class exercise, followed by analytical write-up due following week</strong> [General topic: What happens in health risk communication?]**</td>
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### HEALTH COMMUNICATION: PUBLIC HEALTH

**10 Mar**

The basics of public health communication are pretty well understood:


**12 Mar**

How has the internet changed public health communication?


**14 Mar**

**GUEST SPEAKER:** Either Wednesday or Friday, representatives of Gannett Health Service will talk about how they are integrating social media into a campus health campaign

### HEALTH AND SCIENCE LITERACY

**17 Mar**

Relatively recently, researchers have begun to talk about "health literacy":


**19 Mar**

What does the public actually know about science? What *should* it know? How can we distinguish between "science literacy," "public understanding of science," and "public engagement in science"?


**21 Mar**

What is the difference between “learning” and “engagement”

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<tr>
<td>24 Mar</td>
<td><strong>SCIENCE JOURNALISM</strong></td>
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<td>For this entire week, you should be reading science journalism. In addition to major news sites such as New York Times <a href="https://www.nytimes.com/section/sf">science section</a>, Yahoo! News, or Reuter’s <a href="https://www.reuters.com/science/">science section</a>, the following sites have good material:</td>
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<td>- <em>Not Exactly Rocket Science</em> <a href="https://notexactlyrocketscience.com">link</a>. In addition to Ed Yong’s own writing, look for his weekly “missing links” posts, which point to other stuff around the web. This <a href="https://notexactlyrocketscience.com">link</a> goes to his list of best long-form online science journalism of 2013.</td>
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<td></td>
<td>- <em>The Loom</em> <a href="https://theboom.org/">link</a>, by Carl Zimmer. Be sure to check out his <a href="https://theboom.org/">science tattoo emporium</a>.</td>
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<td></td>
<td>- <em>Elemental</em> <a href="https://elementalworld.com/">link</a>. Deborah Blum is a Pulitzer Prize winning science journalist. She’s particularly interested in poisoning, murder, and sex – sometimes all together.</td>
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<td>- <em>Superbug</em> <a href="https://www.superbug.org/">link</a>, by Maryn McKenna (also known as “Scary Disease Girl”). Grossed out by emerging diseases? McKenna’s the writer for you!</td>
</tr>
<tr>
<td>26 Mar</td>
<td>Science journalism is...what? Some see it as a profession dedicated to informing the public about the latest news of science. Others see it as a tool for educating the public.</td>
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<tr>
<td>28 Mar</td>
<td><strong>GUEST SPEAKER: A local science journalist will visit class on Wednesday or Friday</strong></td>
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<td><strong>SPRING BREAK</strong></td>
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### IMAGES OF SCIENCE IN THE MEDIA

Images of science appear throughout the media -- not just what we get from reading the news, but also images in movies, on television, at EPCOT, and so on. Is the key image one of bubbling beakers and wild hair? Or is there some other way of describing the images out there?


Images associated with gender are particularly important


And what about "lab lit," science in fiction (and science fiction)?

- Additional analytical readings to come

### ASSESSMENT #3: Paper on images and literacy

### SCIENCE MUSEUMS

What is the role of science museums? What interaction is there between research and exhibition? How do "traditional" museums (with collections of stuff) differ from "science centers" (hands-on, interactive science museums)? What's the difference between presenting "packed down" science and exhibiting "cutting edge research"?

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| 16 Apr | And what about historical changes in museums?  
| 18 Apr | GUEST SPEAKER: Wednesday or Friday, we will have a senior science museum staff member talk with class |
| 13    | CITIZEN SCIENCE  
In the last 15 years, a new approach to public engagement has emerged, in which volunteers and school children fully participate in science. They collect the data that the scientists need to do their work. What are the opportunities and challenges associated with that approach? How does it compare with earlier attempts to create a "popular epidemiology" that depends on citizen contribution to medical knowledge?  
- And explore the following websites:  
  o [http://www.citizenscience.org](http://www.citizenscience.org) |
| 21 Apr |  
23 Apr | Popular epidemiology  
| 25 Apr | GUEST SPEAKER: Wednesday or Friday, we will have a senior citizen science organizer talk with class |
| 14    | THE FUTURE OF SCIENCE COMMUNICATION  
The field of science communication is changing fast. In this final full week of classes, we will look at issues that have emerged throughout the first few months of 2014. Readings will be posted as we approach the week. |
For example, one emerging issue involves sexism and racism in science communication:


Another issue is the emergence of DIYBio, hackerspace, and other forms of science and science communication that go beyond citizen science:

- [http://www.DIYbio.org](http://www.DIYbio.org)
- [http://publiclab.org/](http://publiclab.org/)

**Wrap-up: What have we learned?**

So, what have we learned? This week, we'll look at recent scientific publications, recent science news, recent science websites -- in other words, recent science -- and see what role *communication* plays in science.

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| 28 Apr 30 Apr | For example, one emerging issue involves sexism and racism in science communication:  

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| 15 5 May | ASSESSMENT #4: In-class exercise, followed by analytical write-up due on Wednesday  
| 6 May | Final class discussion |
| FINALS | Optional final paper:  
Due at time a final exam would be scheduled for this course |