Course Name: Communication, Environment, Science & Health
Institution: Cornell University
Instructor: Bruce Lewenstein, professor
Course level: Undergraduate
Audience: designed as a sophomore course, but also taken by more advanced students who major in biological and physical sciences, science and society and communications
Semester: Spring 2011
Class schedule: Mondays, Wednesdays and Fridays, 10:10 to 11:00 a.m.
Office hours: Wednesdays, 11:15 a.m. to 1:00 p.m. or happily by appointment
Typical Enrolment: 120-130

Course overview

Scientific research...environmental issues...public health...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. Bulletin boards and 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.

Required texts and reading

Readings and class information are available on the class website on Blackboard.

Grades
The assessments in this course are designed to be part of the learning process (for an explanation of why, see http://nyti.ms/hqYBxp). Thus there are many types of assessment, designed to give you multiple ways to learn as well as to demonstrate your learning. About two-thirds of your grade will be based on two take-home midterms (each a short paper) and a take-home final exam (a mix of short answers and a short paper). The remaining third will be based on weekly bulletin board comments, on approximately bi-weekly comment papers, and on your formal comments on other people's bi-weekly papers.

- Midterm exams: two, for 20% each
- Final exam: 25%
- Weekly discussion board postings: 15%
- Comment papers: seven, for 20% (of which 5% will be reviewing other people’s comments)

**SCHEDULE OF CLASSES AND ASSIGNMENTS**

**Assignment deadlines (also known as "assessments")**

Some of the specific due dates below may change as the course evolves over the semester; the Blackboard site will have updated information. All assignments are required.

- Midterm exams: 2, for 20% each
  - Midterm 1, made available Monday, 1 March; due Friday, 5 March
  - Midterm 2: made available Monday, 12 April; due Friday, 16 April
- Final exam: 25%
  - Made available Friday, 6 May; due Friday, 13 May, 4:30 pm (the end of the time slot set for a final exam for this course) (Note: this is a science communication class; discussion about whether we should even notice that the exam is scheduled for Friday the 13th might be an interesting discussion board topic!)
- Discussion board postings: 15%
  - Weekly (of which, you should initiate at least 3 threads during the semester)
- Comment papers: 20% (of which 5% will be reviewing other people’s comments)
  - Friday, 4 Feb, comment on peer review and journals
  - Monday, 21 Feb, comment on nature documentary shown in class on 18 Feb
  - Wednesday, 9 Mar, comment on issues of risk communication
  - Friday, 18 Mar, comment on issues of health communication
  - Friday, 8 Apr, comment on science journalism
  - Friday, 22 Apr, comment on science imagery
  - Friday, 6 May, comment on the overall course

**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.
• Assignments 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](http://plagiarism.arts.cornell.edu/tutorial/index.cfm). 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](http://plagiarism.arts.cornell.edu/tutorial/index.cfm).

**Class Schedule**

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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<tbody>
<tr>
<td>2</td>
<td>31 Jan</td>
<td><strong>Challenges for communication in the sciences</strong>&lt;br&gt;For example: What if we trust scientists to circulate information before it is peer reviewed? What if discussion takes place at Internet speeds, rather than paper speeds? What if we change the whole system of who pays for communicating?</td>
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</table>
4 Feb  science information?

- Wikipedia on "open access publishing" [link]
- Ginsparg, P. 2008. The Global-Village Pioneers. *Physics World* 22-26. [link] [if that link doesn't work, try this one: link -- it will require you to register on the site]
  o [An early summary of the response to the arsenic-life case, link]
  o [The lead author responds, link]

**GUEST SPEAKER:** Friday, 4 Feb, Dr. Philip Davis, former science librarian and current research associate, Cornell University, on vanity publishing and the reward system. Dr. Davis has been an active researcher on issues in scholarly publishing. To get a sense of his contributions, see:

- Davis, P. M., et al. (2008). Open Access publishing increases online readership of scientific articles but does not increase article citations: A randomised trial. *BMJ*, 337, 343-345. [link]
- Scholarly Publishing Roundtable. (2010, 12 January). Report and Recommendations from the Scholarly Publishing Roundtable. [link to report][link to SPR resources, including letters to Congress that led to report recommendations being included in major legislation in late 2010]

**DUE: Friday, 4 Feb, Comment #1**

3 7 Feb 9 Feb 11 Feb  

**Contexts and models for science communication**
Let's follow one example: Bee-Eaters [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]

To help understand the bee-eaters case, see:
So what does this all mean for how we understand science communication? Do information flows conform to the traditional model of lab-> journal-> public? Can we use "communication theory" to understand what's happening?


**GUEST SPEAKER:** On Friday, 11 February, Prof. Emlen (author of the works we're reading this week) will be in class to talk about the role of science communication in a scientist's life.

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<th>4</th>
<th>14 Feb</th>
<th>Environment: Nature writing</th>
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<tr>
<td></td>
<td>16 Feb</td>
<td>Communication about the environment is first about creating attitudes toward the natural world.</td>
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And here are some classic examples:

- Selections from the writings of Aldo Leopold, author of *Sand County Almanac* [link]

**VIDEO:** Friday, 18 Feb, there will be a video shown in class. That video will be the basis of a “comment” assignment, so you MUST be in class that day.

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<th>5</th>
<th>21 Feb</th>
<th>Environment: Political action</th>
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<td></td>
<td>23 Feb</td>
<td>What role does communication play in public opinion about environmental issues?</td>
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**GUEST SPEAKER:** Wednesday, 23 Feb: JIA Hepeng, editor, *Science Times* (Beijing, China)

**DUE:** Monday, 21 February, Comment #2
<table>
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<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
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<tr>
<td>6</td>
<td>28 Feb</td>
<td>Environment and Health: Risk communication</td>
<td>Enough research has been done on risk to know what the basic recommendations are:</td>
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<td></td>
<td>4 Mar</td>
<td>• <em>CDC Health Risk Communication Primer</em> [link, work your way through the document using links in green box on the upper left]</td>
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<td></td>
<td></td>
<td>• National Research Council (U.S.). Committee on Risk Perception and Communication. (1989). <em>Improving risk communication</em>. Washington, D.C.: National Academy Press.  &lt;Summary, click on &quot;PDF summary&quot; on left to download&gt; &lt;The whole shebang&gt;</td>
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<td><strong>DUE: Friday, 4 March, Midterm Exam #1</strong></td>
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<td>7</td>
<td>7 Mar</td>
<td>Health communication: Doctor-Patient Communication</td>
<td>For many people, the most regular interaction they'll have with risk communication involves their personal health. Some key concepts are in:</td>
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<td></td>
<td>11 Mar</td>
<td>Some of the biggest challenges come at times of stress, such as death or dying:</td>
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<td></td>
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<td>The Internet has dramatically changed health communication. Some issues are addressed in:</td>
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<td><strong>DUE: Wednesday, 9 March, Comment #3</strong></td>
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<td>8</td>
<td>14 Mar</td>
<td>Health communication: Public Health</td>
<td>As in risk communication, the basics of public health communication are pretty well understood:</td>
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Relatively recently, researchers have begun to talk about "health literacy":


**GUEST SPEAKERS:** Wednesday, 16 March, Jan Talbot and Catherine Thrasher-Carroll of Gannett Health Service's health education unit will talk about health campaigns on campus.

**DUE: Friday, 18 March, Comment #4**

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**9**

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<th>28 Mar</th>
<th>30 Mar</th>
<th>1 Apr</th>
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<td><strong>Science literacy</strong>&lt;br&gt;What does the public actually know about science? What <em>should</em> it know? How can we distinguish between &quot;science literacy,&quot; &quot;public understanding of science,&quot; and &quot;public engagement in science&quot;?</td>
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Perhaps we should be focusing on “learning science in informal environments.”
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| 4 Apr | Science journalism  
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. Some introductions:  

And still others call it "perky cheerleading" for science -- and that's not intended as a compliment:  

**GUEST SPEAKER:** On Friday, 4 April, a local science writer, Alison Fromme '99, will talk about her career.  
**DUE:** Friday, 8 April, Comment #5 |
| 6 Apr |  
| 8 Apr |  
| 11 Apr | Images of science in the media  
Images of science appear throughout the media -- not just what we get from reading...
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<td>13 Apr</td>
<td>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?</td>
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You can also see collections of commentaries on movie science at BadAstronomy.com  
  - [Bad movie physics](#) |

**DUE: Friday, 15 April, Midterm Exam #2**

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<th>Date</th>
<th>Topic</th>
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| 12    | **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"? |
GUEST SPEAKER: On Friday, 22 April, the *Museum of the Earth*'s Associate Director for Outreach, Rob Ross, will visit class. |
| 20 Apr | [DUE: Friday, 22 April, Comment #6](#)  
22 Apr | |

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<th>Date</th>
<th>Topic</th>
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You can also see collections of commentaries on movie science at BadAstronomy.com  
  - [Bad movie physics](#) |

**DUE: Friday, 15 April, Midterm Exam #2**
**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?

- [www.scienceforcitizens.net](http://www.scienceforcitizens.net) -- skim this site for examples of "citizen science"

**GUEST SPEAKER:** On Wednesday, 27 April, Rick Bonney from the Cornell Lab of Ornithology will come to talk about citizen science projects.

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<th>13</th>
<th>25 Apr</th>
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<th>13 May, 4:30 pm</th>
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<td>27 Apr</td>
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<td>DUE: Friday, 6 May, Comment #7</td>
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<td>29 Apr</td>
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<td>FINAL PAPER DUE on Friday, 13 May, 4:30 pm (the end of the time slot set for a final exam for this course)</td>
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**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.

**DUE: Friday, 6 May, Comment #7**

**FINALS**

13 May, 4:30 pm