

**Science and Citizenship:  
Environment, Technology & Democracy (ENVI 335/POLI 335)  
Macalester College, Spring 2015  
Tues/Thurs – 1:20 – 2:50pm OLIN RICE 270**

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**Course Description**

Rachel Carson's 1962 publication *Silent Spring* harkened the beginning of the environmental citizen science movement in America. This knowledge revolution suggested that everyday citizens had an important role to play in deciding, observing and contesting how science and technology were being developed and implemented for the good of humanity and the natural world. In our present day, the Silent Spring Institute based in Cape Cod continues to push Carson's agenda forward on important enviro-scientific controversies like the fight against breast cancer.



Styrofoam Henge, where modern technology clashes with an ancient civilization.

Taking our cue from Carson, this course examines the role of citizens in environmental decision-making. We will focus on environmental controversies as important sites for examining how information, science and governance come together. Through our engagement with a range of environmental controversies we will think through some core concepts: **risk, uncertainty, expertise, transparency, credibility, trust, deliberation and citizenship.**

Students will also be introduced to the field of science and technology studies (STS). STS scholars have been at the forefront of thinking about how citizens are involved in the production and deployment of science and technology. STS frameworks will help us evaluate how we understand and construct avenues for public engagement on these fundamental societal questions.

## **Student Evaluation**

Students will be evaluated on the basis of:

### **1) Attendance & participation (20%)**

You are expected to attend every class. If you must be absent due to illness or other extenuating circumstance, contact me as soon as possible. More than one absence may result in a reduction in your participation grade. If you are late to class regularly, this may be counted as an absence. You are responsible for checking in with your peers for missed material. Your participation grade will be based on thoughtful, respectful, and productive engagement in class discussions. Your creativity is always encouraged.

*Part of your participation grade includes attending and doing a write up of at least one public science event, such as a Café Scientifique or Social Science event, over the course of the semester. See list at the end of the syllabus.*

### **2) Submission of 12 reading reflections (30%)**

Reading reflections are intended to encourage you to synthesize reading material and help me organize our class discussions. Class meetings marked by \* indicate that a reflection is due. Your reflections are **due by 10am** the day of class. Your pieces should be approximately 300-400 words in length, about two to three paragraphs. They must be submitted through the course website. DO NOT e-mail reflections to me. Late reading reflections will not be accepted. These will be graded on a four point scale satisfactory (C), good (B), excellent (A-) and outstanding (A) basis for each submission. Occasionally, I will respond directly to your submission on Moodle. Most times, I will refer to issues raised in your reflections in class. See Guide to Writing Reading Reflections on the Moodle site.

### **3) Co-leading class discussion twice (20%)**

You will be asked to co-lead class twice. Working in a small group, you will be responsible for leading a **CASE STUDY PROJECT** and a **FILM DISCUSSION**. More details about the expectations for each of these assignments will follow. *You are not expected to turn in a reflection when you are leading classes.*

### **5) Controversy Study Project (Total 30%)**

You will choose a controversy to follow throughout the semester. See the final page of this syllabus for some topic examples. You can also see past student projects at:

<http://www.macalester.edu/environmentalstudies/students/projects/projects.htm>

This research project is aimed at analyzing your controversy for a public/lay audience with a goal of translating and assessing available information/arguments. It will be evaluated in **five** stages throughout the semester. You will be asked to present 1) **Topic Proposal (Tues March 3)** 2) an **Outline & Workplan (Tues April 7)** 3) a **Working Draft** (peer reviewed in class on **Tues April 21**) and 4) a **Final Submission (April 30/May 8)**. You may choose the final format for your assignment. It can be a journalistic article or blog (approx. 10 pages), a website, podcast or 5 min TED-style lecture. More details about the project will follow. We will also practice writing controversies through a special workshop with the Science Museum of Minnesota.

*If you submit any of the above assignments late, you WILL be graded down one full step for each day past the deadline. For example, an assignment handed in one day late will begin with a B+; two days late a C+.*

**Final Grade Scale:** A (96-100); A- (91-95); B+ (87-90); B (83-86); B- (80-82)  
Similar ranges for C grades (70-79) and D grades (60-69); Below 60 is a failing grade.

**Academic Integrity:** It is assumed that all members of the class will act with academic integrity and will not engage in behavior such as plagiarism, academic dishonesty, misrepresentation, or cheating. Please refer to the college's policy on academic honesty.

**Laptops, Cell Phones, & Other Electronic Devices:** Please turn off all electronic devices before class begins.

**Accommodations for Students with Disabilities:** I am committed to providing assistance to help you be successful in this course. Reasonable accommodations are available for students with documented disabilities. Please meet with the Associate Dean of Students, Lisa Landreman, at the beginning of the semester to discuss any accommodations you may need. Her email is llandrem@macalester.edu.

## Summary of Topics and Readings

### Part I: Introduction to Science, Technology and Politics

#### **Thurs Jan 22: Course Introduction**

Discussion of Dave Egger's *The Circle*

#### **\*Tues Jan 27: Do we trust science/scientists? Scientists as Citizens**

- S. Bocking. 2004. "Chapter 2: The Uncertain Authority of Science" in *Nature's Experts*. Piscataway, NJ: Rutgers Press. Pp. 16-44.

- J. Lubchenco. 1998. "Entering the Century of the Environment: A New Social Contract for Science," *Science* Vol. 279: 491-496.

#### **\*Thurs Jan 29: Do we trust democracy? Citizens as Scientists**

- S. Bocking. 2004. "Chapter 8: Democratic Environmental Science" in *Nature's Experts*. Piscataway, NJ: Rutgers Press. Pp. 199-225.

- B. Barber. "Chapter 7: A Conceptual Frame" and "Chapter 10: The Real Present" in *Strong Democracy*. Berkeley: UC Press. Pp. 139-162; 261-311.

- National Science Foundation. 2014. *Survey of Public Attitudes Toward and Understanding of Science and Technology*.

#### **\*Tues Feb 3: Science, Denialism and the Media with guest Jessica Marshall**

- J. Gregory et. al. 2000. "The Recent Public Understanding of Science Movement," in *Science in the Public*. NY: Perseus Publishing. Pp 1-18.

- M. Boykoff and J. Boykoff. 2004. "Balance as bias: global warming and the US prestige press". *Global Environmental Change* 14 (2), 125-136

Also -- <http://www.guardian.co.uk/science/blog/2012/jan/17/scientists-journalism>

#### **\*Thurs Feb 5: Models of Citizen Science**

Everyone read:

- J. L. Dickinson and R. Booney. 2012. *Citizen science: public participation in environmental research*. Ithaca: Comstock Publishing. Pp. 1-14; 19-57 (skim); 226-233.

And then you will be assigned to one group:

Gulf oil spill:

- S. McCormick. 2012. "After the Cap: Risk Assessment, Citizen Science and Disaster Recovery," *Ecology and Society* 17(4): 31-41.  
<http://www.ecologyandsociety.org/vol17/iss4/art31/>

Fukushima – Safecast:

- Y. Abe. 2013. "Why Safecast matters: A case study in collective risk assessment".  
<http://fukushimaforum.wordpress.com/workshops/sts-forum-on-the-2011-fukushima-east-japan-disaster/manuscripts/session-3-radiation-information-and-control/why-safecast-matters-a-case-study-in-collective-risk-assessment/>

**Tues Feb 10: Art and Science – City Art Collaboratory with Shanai Matteson and Amanda Lovelee of Public Arts Saint Paul**

2010. "Who Makes Science" in *Science is Culture*.

Also visit: <http://www.publicartstpaul.org/urbanflowerfield>

Assignment: Bring an example of a science + art project you find intriguing to class

**Thurs Feb 12: Play Day I – with guest Stephanie Long, Director, Science Live Theater**  
*You will receive your script assignment today*

**Tues Feb 17: Consensus Conferences and Citizen Juries at work – near and far with invited guest Kyle Bozentko, Exec Director, Jefferson Center**  
- Jefferson Center. 2014. Morris Rural Dialogues report.

**Thurs Feb 19: Play Day II - Script reading with the actors from Science Live Theater**

## **Part II: Case Study Modules**

### **Topic A: Food**

**\*Tues Feb 24: Lecture: Agriculture, Genes and Power with guest Adam Kokovotich, UMN on Wild Rice Project**

- 2011. Preserving the Integrity of Manoomin in Minnesota. UMN White paper.

- P. Berg. 2008. "Asilomar 1975: DNA modification secured," *Nature* Vol 455 (18): 290-291.  
Assign Barben piece on antic governance STS Handbook?

**Thurs Feb 26: Student led case study on food and biotech**

**OPTIONAL Mon March 2: Theater of Public Policy – 6pm fieldtrip Bryant Lake Bowl**

**\*Tues March 3: Film - *Soylent Green***

\*Final project **Proposals** Due

### **Topic B: Environmental health and justice**

**\*Thurs March 5: Lecture: Are We a Toxic Nation? With guest Anthony Dixon, City of Minneapolis Health Department**

- P. Brown. 2007. "Preface" and "Chapter 1: Citizen Science and Health Social Movements", in *Toxic Exposures*. NY: Columbia Univ Press. Pp. xiii-xxxi; 1-42. *Skim most of this – focus on last part of Chapter 1.*

- J. Coburn. "Chapter 1: Local Knowledge in Environmental Health Policy" in *Street Science*. Pp. 25-45.

**Tues March 10: Student led case study on biomonitoring**

**\*Thurs March 12: Student led film discussion - *Erin Brokovich***

**\*\*\*SPRING BREAK March 16-20\*\*\***

**Topic C: Regulating the Energy Industry**

**\*Tues March 24: Lecture: Accidents and Incidents**

- C. Perrow. 1984. Chapters 1-3. *Normal Accidents: Living with High Risk Technology*. NY: Basic Books. Pp. 15-100. *Note: Skim chapters one and two – focus on Chapter three.*

**Thurs March 26: Student led workshop**

**\*Tues March 31: Film - *China Syndrome***

**Thurs April 2: *EVENING* Fieldtrip to Guthrie for “Mr. Burns: A Post-Electric Play”**

**Tues April 7: RESEARCH DAY:** Share an outline and workplan of your paper and describe the ways in which you are building on citizen science scholarship

**Topic D: Geoengineering the Climate**

**\*Thurs April 9: Lecture: Weather Modification and other Technological Silver Bullets**

- John McPhee. 2000. “Cooling the Lava,” in *The Control of Nature*. New York: Farrar, Straus and Giroux. Pp 95–179.

- Dilling, L., & Hauser, R. (2013). “Governing Geoengineering Research: Why, When and How?” *Climatic Change*, 121(3), 553-565

- Seed Special issue:

[http://seedmagazine.com/content/article/will\\_the\\_future\\_be\\_geo-engineered1/](http://seedmagazine.com/content/article/will_the_future_be_geo-engineered1/)

**Tues April 14: Student led workshop - Asilomar 2.0**

**\*Thurs April 16: Film – *The Core***

**Tues April 21: RESEARCH DAY:** Peer review drafts in small groups in class and discuss your plans for further development

**\*Drafts due by in class to Roopali and your peer group by email before class**

**III. Putting New Knowledge into Practice**

**Thurs April 23: Science in Action – Museums as Sites of Public Engagement** (fieldtrip to Science Museum of Minnesota) with guest Robert Garfinkle (Science and Social Change)

**Tues April 28: New Frontiers in Technology**

- S. Jasanoff. 2003. "Technologies of Humility: Citizen Participation in Governing Science." *Minerva* Vol 41 (3). Pp. 223-244.

**Thurs April 30: Debut Final Projects IN CLASS**

**FINAL Project DUE FRIDAY MAY 8 5pm.**

## A Guide to Writing Reading Reflections

Reading reflections are meant to help you synthesize the readings and begin articulating your personal positions on the issues to be discussed in class.

Ideally, your piece will:

- 1) highlight issues you found interesting, surprising or confusing **across** the readings assigned for that class session
- 2) raise questions that you think we should discuss in class

Your piece can also focus on addressing one or more of the following questions:

- What is the significance of this set of reading? What questions do they raise and/or attempt to address?
- How do they fit with, challenge, reflect/concur, and/or link with other readings and approaches taken in the course material?
- Do you find the arguments and presentation of material compelling, convincing, persuasive and how so?

Reflections are **due by 10am** the day of class. Your pieces should be approximately 300-400 words in length, roughly three paragraphs.

You must upload your assignment to the Moodle site for that date.

**NOTE:** The Moodle clock does not always correspond to yours – Moodle will timeout at 9pm so don't wait until the last minute.

Please **DO NOT** e-mail reflections to me – I simply can't handle that volume of emails. Late reading reflections will not be accepted.

Occasionally, I will respond directly to your submission on Moodle. Most times, I will refer to issues raised in your reflections in class.

Reflections will be graded on a five point scale:

**unsatisfactory** (= D), **satisfactory** (=C), **good** (=B), **excellent** (B+/A-) or **outstanding** (=A) basis for each submission.

An **unsatisfactory** grade is for a poor and incoherent piece that does not connect to the assigned texts.

A **satisfactory** grade represents a reflection that minimally commented on the reading, offering more summary than extended critical reflection.

A **good** grade represents a reflection that commented on the reading but missed discussion topics.

An **excellent** grade represents a reflection that provided critical commentary and suggested some class discussion points.

An **outstanding** grade represents a reflection that provided thoughtful analysis and commentary of the text/s and provided provocative discussion ideas.

*\*\* Most importantly - Reflections are not intended to be busy work. I **want** to know if you found the material interesting and challenging. Your writing also helps me direct our class discussions. For those students who are less likely to feel comfortable speaking often in class, this is my best chance at knowing your thoughts.*

## **SAMPLE OF FINAL PROJECT CONTROVERSY TOPICS**

Silicon Breast Gel Implants

Stem cell research

Nanotechnology

Endocrine Disruptors

Atrozime and frogs

DDT Use

Human and Animal Cloning

Smart Meters

Cryogenics

Bioprospecting

Organ Printing

Drone Development

EXAMPLES of past web projects can be found at

<http://www.macalester.edu/environmentalstudies/students/projects/projects.htm>

## Science and Culture Events

You are required to attend one event during the semester. We will plan a group trip to one.

### 1. Café Scientifique from Bell Museum at the Bryant Lake Bowl

Schedule at <http://www.bellmuseum.umn.edu/ForAdults/CafeScientifique/>

#### A Happy Hour Forum for Science and Culture

The Bell Museum's Café Scientifique provides a happy hour program for adults that brings research from the University of Minnesota and beyond into some of the Twin Cities' most unique and atmospheric bars and restaurants.

Each month ly gathering explores science and natural history from distinct and surprising viewpoints, drawing connections between scientific research, culture, environment and everyday life.

### 2. A Sip of Science

Schedule at <http://www.nced.umn.edu/content/sip-of-science>

A SIP OF SCIENCE is a new science happy hour sponsored by NCED. It is a forum for researchers, policy-makers, musicians, and artists to put science in context through storytelling - all over beer, in a cool bar.

**When:** 2nd Wednesday of each month, 5:30pm

**Where:** Aster Cafe, Saint Anthony Main, Minneapolis

### 3. Social Science

Schedule <http://www.smm.org/socialscience>

An adult night at the Science Museum of Minnesota, welcoming those 21 and over to grab a drink, enjoy the museum, and experience innovative programming.

**You must present a valid 21+ ID to gain entrance to the museum.**

#### *In the Dark*

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**Thursday, February 5, 6-11 p.m.**

Explore a darkened museum and all that glows, flickers and shines this Social Science. With LED jewelry and laser mazes, luminescence and phosphorescence, it's an experience you won't want to miss.