

Culture & Belief 61

GENDER AND SCIENCE: FROM MARIE CURIE TO GAMERGATE

Spring 2015

Tues/Thurs 10-11 am, plus section to be arranged
Sever Hall - 213

Prof. Sarah S. Richardson, srichard@fas.harvard.edu
Office hours: Wednesday, 10 am – 12 noon by online sign-up

Head TF: Leena Akhtar, akhtar@fas.harvard.edu



Course Description

Why are women well represented in some fields of scientific study but not others? Do gender beliefs influence the content of scientific knowledge? How is gender encoded in the practices and norms of science? This course explores the intersection of gender and science from Bacon's seventeenth-century call to raise a "masculine" science to the present. Topics include: girls, boys, and science education; gender and technology; women in the science professions; bias and objectivity in science; and gender and science in literature, film, and popular culture.

General Education Objectives

This is an open enrollment, introductory-level course requiring no special background. This course satisfies the requirements for a General Education course in Culture and Belief as well as Studies of Women, Gender, and Sexuality and History and Science. We will explore how gender is a central dimension of the culture, social structure, authority,

cognitive practices, and knowledge claims of science, and how scientific institutions, authority, ideals, practices, and knowledge play a critical role in the maintenance of sex and gender norms. This course explores questions at the nexus of science and gender through engagement with contemporary controversies and direct encounter with diverse primary sources. Through course activities and assignments, this course models integrative knowledge practices that invite you to draw connections across the social sciences, humanities, and natural sciences.

Course Requirements

- Regular attendance
- Participation in a weekly discussion section
- Attendance at a minimum of 3 course events (guest speakers and film screenings)
- Two short 5-7 pp. written or multimedia essays (one revision permitted)
- A final project (includes a *workshopping process*, a *proposal*, a *poster*, and a *write-up* of 8-10 pp.). Group projects are an option.
- *Graduate students: see professor for course requirements*

Grading

Attendance, participation, and preparation (includes attendance at course-related events)	10%
Essay 1	25%
Essay 2	25%
Project pitch and workshopping	5%
Project proposal	5%
Final project	30%

Required books (books are available at the Harvard Coop and on reserve at Lamont)

1. Conley, Frances K. *Walking Out on the Boys*. New York: Farrar, Straus and Giroux, 1998.
2. Fausto-Sterling, Anne. *Sexing the Body: Gender Politics and the Construction of Sexuality*. New York: Basic Books, 2000.
3. Foucault, Michel. *The History of Sexuality, Volume 1*.
4. Margolis, Jane and Allan Fisher. *Unlocking the Clubhouse: Women in Computing*. Cambridge, Mass.: MIT Press, 2002.

5. Schiebinger, Londa. *The Mind Has No Sex? Women in the Origins of Modern Science*. Cambridge: Harvard, 1989.
6. One of the following novels (any edition, any format):
 - Ursula K. Le Guin, *The Left Hand of Darkness* (1969)
 - Joanna Russ, *The Female Man* (1975)
 - Marge Piercy, *Woman on the Edge of Time* (1976)

Course Schedule

Jan. 27 Welcome & course overview

- *No reading*

Jan. 29 Gender and science: major themes and frameworks

Recommended:

- Keller, Evelyn Fox. "Feminist Perspectives on Science Studies." *Science, Technology, & Human Values* 13, no. 3/4 (1988): 235-249.
- Jordanova, Ludmilla. "Gender and the Historiography of Science." *The British Journal for the History of Science* 26, no. 4 (1993): 469-483.

Unit 1. Women in Science

Feb. 3 Introduction to the "Women in Science" Question

Recommended:

- Rossiter, Margaret W. "Which Science? Which Women?" *Osiris* 12 (1997): 169-185.
- Hammonds, Evelyn and Banu Subramaniam. "A Conversation on Feminist Science Studies." *Signs* 28, no. 3 (2003): 923-944.
- Schiebinger, Londa L. *The Mind Has No Sex?: Women In The Origins Of Modern Science*. Cambridge, Mass.: Harvard University Press, 1989, Introduction.

Feb. 5. Raising a Masculine Science: 16th - 18th Centuries

- Schiebinger, Londa L. *The Mind Has No Sex?: Women In The Origins Of Modern Science*. Cambridge, Mass.: Harvard University Press, 1989, Chapters 1-5, 9-10
- *Recommended:* Poulain de la Barre, François. *The Woman as Good as the Man: Or, The Equality of Both Sexes*, trans. A. L., London, N. Brooks, 1677. (excerpt)

Feb. 5 Discussion section (optional)

Meet your Teaching Fellows! This session will include a group discussion of this week's readings from Schiebinger's *The Mind Has No Sex* and an introduction to working with archival resources on women and gender in science, with examples from the Harvard collections. *Note: Sectioning process begins on Feb. 6 and the first required sections meet next week.*

Feb. 10 Professionalization of Science: Women in Science in the 19th & early 20th Centuries

- Rossiter, Margaret W. "'Women's Work' in Science, 1880-1910." *Isis* 71, no. 3 (1980): 381-398.
- Clarke, Edward H. *Sex in Education*, 1874. (excerpt)
- Roman, C. V. "Woman's Work." *Journal of the National Medical Association* 2, no. 1 (1910): 1-6.
- "A Mind of My Own": Letter from Hélène Metzger to Émile Meyerson, 1933.

Special event:
Screening and discussion of "It Came From Beneath the Sea" (1955) at the Harvard Film Archive
Wednesday, Feb. 11, TBA

Feb. 12 Postwar 20th Century Women in Science: Managing Family, Femininity, Race, Class, and Sexuality in the Workplace

- McNeil, Maureen. "Making Twentieth-Century Scientific Heroes." *Feminist cultural studies of science and technology*. New York: Routledge, 2007.
- Raskin, Betty Lou. "Woman's Place is in the Lab, Too." *The New York Times Magazine*, 1959.
- Granville, Evelyn Boyd. "My Life as a Mathematician." *SAGE: A Scholarly Journal on Black Women*, Vol 6, No. 2 (Fall 1989), pp. 44-46.
- Film: "It Came From Beneath the Sea" (1955)

Special event:
Guest speaker Professor Rebecca Jordan-Young, Barnard College, on gendered toys and science career preferences
Week of Feb. 16, TBA

Feb. 17 After Title IX

- Conley, Frances K. *Walking Out On The Boys*. New York: Farrar, Straus and Giroux, 1998.
- Ryan, Michael. "A Ride in Space: As She Prepares to Break the Sex Barrier, America's First Woman in Orbit Is Steady, Professional—and Annoyed by the Attention." *Time*. June 20, 1983 Vol. 19 No. 24

Feb. 19 The Status of Women and Sexual Minorities in the Science Professions Today: Key Issues

- Pollack, Ellen. "Why Are There Still So Few Women in Science?" *New York Times*, 2013.
- Subramaniam, Banu. "Resistance is Futile! You Will Be Assimilated: Gender and the Making of Scientists," in *Ghost Stories for Darwin*, 2014.
- *Recommended:*
 - Moss-Racusin, Corinne A., John F. Dovidio, Victoria L. Brescoll, et al. "Science Faculty's Subtle Gender Biases Favor Male Students." *Proceedings of the National Academy of Sciences* 109, no. 41 (2012): 16474-16479.
 - "From the Field: 'Hazed' Tells Her Story of Harassment." *Context and Variation* blog at *Scientific American*, 2012.
 - Cech, Erin A. and Tom J. Waidzunus. (2011). "Navigating the Heteronormativity of Engineering: The Experiences of Lesbian, Gay, and Bisexual Students." *Engineering Studies*, Vol. 3(1): 1-24.

Feb. 24 'Women in Science' Initiatives: Transformative Innovations

Recommended:

- "A Study on the Status of Women Faculty in Science at MIT," 1999.
- Clancy, Kathryn B. H., Robin G. Nelson, Julianne N. Rutherford, et al. "Survey of Academic Field Experiences (SAFE): Trainees Report Harassment and Assault." *PLoS ONE* 9, no. 7 (2014): e102172.
- "This is What a Scientist Looks Like" (blog)
- "ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers," National Science Foundation (program brochure).
- Hewlett, Sylvia Ann, Carolyn Buck Luce, and Lisa J. Servon, "Stopping the Exodus of Women in Science," *Harvard Business Review* (2008)
- Budden, Amber E., Tom Tregenza, Lonnie W. Aarssen, et al. "Double-Blind Review Favours Increased Representation Of Female Authors." *Trends in Ecology & Evolution* 23, no. 1 (2008): 4-6.

Unit 2.

Gender & Technoscience in Popular Culture

Feb. 26 Gamergate

- Turkle, Sherry. "TinySex and Gender Trouble," in *Life on the Screen: Identity in the Age of the Internet* (Simon and Schuster, 1995): 210-32.
- *Recommended:*
 - Dewey, Caitlin, "The Only Guide to Gamergate You'll Ever Need to Read." *The Washington Post*. Oct. 14, 2014.
 - Lewis, Leslie-Ann. "Leaking Nudes." *Model View Culture: Technology, Culture and Diversity Media*. Dec. 9, 2014.

Unit 1 assignment due Mar. 2 at midnight; upload to course site

Special event:
Women and Gender History Wikipedia edit-a-thon
Schlesinger Library, Radcliffe Yard
Monday, March 2, 4-6 pm

Mar. 3 Introduction to Gender & Technoscience

- Light, Jennifer. "When Computers were Women." *Technology and Culture* 40:3 (1999), 455-483.
- Grossman, Rachael. "Women's Place in the Integrated Circuit," *Radical America* 14 (1980)

Mar. 5 Gender and Tech-Worlds

- Margolis, Jane and Allan Fisher. *Unlocking The Clubhouse: Women In Computing*. Cambridge, Mass.: MIT Press, 2002.
- Miller, Claire Cain. "Technology's Man Problem." *New York Times*, 2014.

Special event:
Screening and discussion of "Jurassic Park" (1993), led by
Professor Joanna Radin, Yale University
Monday, March 9, TBA

Mar. 10 Film and Fiction: Representations of Women and Gender in Science

- Flicker, E. (2003). Between brains and breasts—Women scientists in fiction film: On the marginalization and sexualization of scientific competence. *Public Understanding of Science*, 12, 307-318.

- *Recommended:* Mulvey, Laura. "Visual Pleasure and Narrative Cinema." *Screen* 16, no. 3 (1975): 6-18.
- Film: "Jurassic Park" (1993)

Mar. 12 Women and Gender in Science Fiction

- Russ, Joanna. "Images of Women in Science Fiction." *Images of Women in Fiction: Feminist Perspectives*. Ed. Susan Koppelman Cornillon. Bowling Green, OH: Bowling Green UP, 1972, 79-94.
- *Recommended:* Bakhtin, Mikhail. "Discourse in the Novel." *The Dialogic Imagination: Four Essays*. Trans. Michael Holquist and Caryl Emerson. Austin: U of Texas P, 1981. (excerpt)

~Spring break~

Mar 24 Feminist Science Fiction: Mutants, Cyborgs, and Androgynes

- Larbalestier, Justine. "The Women Men Can't See." In *The Battle Of The Sexes In Science Fiction*, Middletown, Conn.: Wesleyan University Press, 2002.
- Read one of the following novels:
 - Ursula K. Le Guin, *The Left Hand of Darkness* (1969)
 - Joanna Russ, *The Female Man* (1975)
 - Marge Piercy, *Woman on the Edge of Time* (1976)

Mar. 26 Challenging Stereotypes: Hacking Gender and Technoscience

Recommended:

- Girls Who Code (article)
- Goldieblox (website: "About")
- Feminist Hacker Barbie (links)
- Carnegie Mellon University's Women in Engineering Initiative (overview)
- Wikipedia Women in Science Edit-a-Thons (examples)
- Hackbright Academy (website)
- Feminist Frequency (website)
- The James Tiptree, Jr., Literary Award (website)
- "We really just want to work on what we love": A feminist manifesto by women in tech
- SubRosa cyberfeminist collective (website)
- *Model View Culture: A journal of technology, culture and diversity media*

Unit 3.

The X and the Y: Gender & the Science of Sex

Unit 2 assignment due Mar. 30 at midnight; upload to course site

Mar. 31 Introduction: Gender, Science, and Children's Toy Preferences

- Wolpert, Lewis. "Yes, it's official, men are from Mars and women from Venus, and here's the science to prove it." *The Telegraph*, 2014.
- Fine, Cordelia. *Delusions Of Gender: How Our Minds, Society, And Neurosexism Create Difference*. New York: W. W. Norton, 2010. (excerpt)
- *Recommended:*
 - Alexander, Gerianne M., and Melissa Hines. "Sex Differences in Response to Children's Toys in Nonhuman Primates (*Cercopithecus Aethiops Sabaeus*)." *Evolution and Human Behavior* 23, no. 6 (November 1, 2002): 467–79.
 - Nordenström, Anna, Anna Servin, Gunilla Bohlin, Agne Larsson, and Anna Wedell. "Sex-typed Toy Play Behavior Correlates with the Degree of Prenatal Androgen Exposure Assessed by CYP21 Genotype in Girls with Congenital Adrenal Hyperplasia." *The Journal of Clinical Endocrinology and Metabolism* 87, no. 11 (November 2002): 5119–24.
 - Jordan-Young, Rebecca M. "Hormones, Context, and 'Brain Gender': A Review of Evidence from Congenital Adrenal Hyperplasia." *Social Science & Medicine*, 74, no. 11 (June 2012): 1738–44.
 - Fausto-Sterling, Anne, Cynthia Garcia Coll, and Meghan Lamarre. "Sexing the Baby: Parts 1 & 2" *Social Science & Medicine* 74, no. 11 (2012).

Apr. 2 Binaries & Hierarchies: Sex , Gender, and Sexuality in Nature and Cosmos

- Schiebinger, Londa L. *The Mind Has No Sex?: Women In The Origins Of Modern Science*. Cambridge, Mass.: Harvard University Press, 1989, Chapter 6-8
- *Recommended:* Shteir, Ann B. "Spreading Botanical Knowledge throughout the Land, 1760-1830." In *Cultivating Women, Cultivating Science: Flora's Daughters and Botany in England, 1760-1860*, Baltimore: Johns Hopkins University Press, 1996, pp. 9-32.

Apr. 7 Knowledge, Power, and the Body

- Foucault, Michel. *The History of Sexuality, Volume 1*. New York: Vintage Books, 1988.
- Hausman, Bernice L. "Demanding Subjectivity: Transsexualism, Medicine, and the Technologies of Gender." *Journal of the History of Sexuality* 3, no. 2 (1992): 270-302.

Apr. 9 Project Pitch Day!

Come prepared to present a “pitch” for your project (see guidelines); we’ll be workshopping and honing your final project ideas in small group discussion.

Final project proposal due April 13 at midnight; upload to course site

Apr. 14 What is Sex?

- Chapters 1-4 of *Sexing the Body*, pp. 1-114
- Levy, Ariel. "Either/Or: Sports, sex, and the case of Caster Semenya," *The New Yorker*, 2009.

Apr. 16 Brains and Hormones

- Chapters 5-8 of *Sexing the Body*, pp. 115-232
- *Recommended:* McCarthy, R. M., and A. P. Arnold. "Reframing sexual differentiation of the brain." *Nature Neuroscience* 14 (2011): 677-683.

Special event:

**Guest speaker Meghan Amran, comedian and author of
“SCIENCE...for GIRLS!”**

Friday, April 17, 12:00-1:30 pm

Special event:

**Guest speaker Professor Katie Hinde, Harvard University
(HEB), on her 2014 study of sexual harassment in science
and its impact**

Monday, April 20, 4:00-5:30 pm

April. 21 Debating the Sex Difference Paradigm

- Chapter 9 of *Sexing the Body*
- Epstein, Steven. “Sex Differences and the New Politics of Women’s Health.” In *Inclusion: The Politics of Difference in Medical Research*. Chicago: University of Chicago Press, 2007.
- *Recommended:*
 - Weber, Daniela, Vegard Skirbekk, Inga Freund, and Agneta Herlitz, “The changing face of cognitive gender differences in Europe.” *PNAS* 2014 111 (32) 11673-11678

- Kane, Jonathan M., and Janet E. Mertz. "Debunking Myths about Gender and Mathematics Performance." *Notices of the American Mathematical Society* 59, no. 1 (2012): 10-21.
- Hyde, J. S. "The gender similarities hypothesis." *Am Psychol.* 60, no. 6 (2005): 581-592.
- Fausto-Sterling, Anne. "Bare Bones of Sex: Part I, Sex & Gender." *Signs* 30, no. 2 (2005): 1491-1528.
- Krieger, Nancy. "Genders, sexes, and health: what are the connections--and why does it matter?" *International Journal of Epidemiology* 32, no. 4 (2003): 652.

Apr. 23 Making Gender Visible and Asking New Questions: Feminism and the Science of Sex and Gender

- Richardson, Sarah S. "The Search for the Sex-Determining Gene." In *Sex Itself: The Search for Male And Female in the Human Genome*, 81-102: Chicago, 2013.
- Roy, Deboleena. "Asking Different Questions: Feminist Practices for the Natural Sciences." *Hypatia* 23, no. 4 (2008): 134-156.
- *Recommended:*
 - *Gendered Innovations in Science and Engineering* (website)
 - *Context & Variation* (blog)
 - *Gap Junction Science* (blog)
 - Special issue of *Signs*, "Feminism Inside the Sciences" (2003): "Has Feminism Changed Archaeology?" by Margaret Conkey, "Has Feminism Changed Physics?" by Amy Bug, and "Sexual Natures: How Feminism Changed Evolutionary Biology," by Patricia Adair Gowaty.]
 - Haraway, Donna. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14, no. 3 (1988): 575-599.
 - Longino, Helen E. "Can there be a feminist science?" *Hypatia* 2, no. 3 (1987).
 - Harding, Sandra. "Rethinking Standpoint Epistemology: What is 'Strong Objectivity'?" In *Feminist Epistemologies*, edited by Linda Alcoff and Elizabeth Potter, 49-82. New York: Routledge, 1993.

Unit 3 assignment due April 27 at midnight; upload to course site

Apr. 28 Closing Lecture: Whose Science? Empiricism, Objectivity, and Trust in Science in a Diverse World

- *No reading*

May 13 Final Project Poster Session

Course guidelines

Course website:

The course website (<https://canvas.harvard.edu/courses/1890>) is basecamp for this course. Check the site frequently.

Class announcements:

Announcements will be posted on the course website. Urgent announcements will be sent to your Harvard email account. You are responsible for checking the course website and your Harvard email regularly.

Class attendance:

On-time attendance, preparation, and full participation are expected. More than three absences or late arrivals is grounds for dismissal from the course.

Required reading:

There is an average of 100 pages of required reading/week in this class. Please plan accordingly. Recommended readings are not mandatory, but will enhance your understanding of the course material.

Late policy:

Deadlines are firm. Late assignments will incur a 5% penalty for the first day and 5% after that. If an assignment is due at 5 pm, and you turn it in at 5:30 pm, the highest grade that you can receive is a 95. The professor/TF reserves the right not to provide written feedback on late work. Extensions are granted only with advance notice and usually only in cases of illness.

Office hours:

Please visit me in office hours during the semester. Sign up for office hours using the online sign-up posted on the course website. If you are unable to attend scheduled office hours, email me to set up a time to meet.

Email:

Keep email to a minimum, and if you email me, keep it brief and professional. Please visit me or your TF in office hours if you have detailed questions about the assignments or readings. Do not rely on email for last minute questions.

Technology policy:

No use of laptops, tablets, or phones in class.

Statement on disabilities:

If you have a documented physical, psychological, or learning disability, please notify me within the first two weeks of the semester regarding reasonable and appropriate academic accommodations to help you succeed in this course.

Statement on academic honesty:

Academic dishonesty (cheating, fabrication, plagiarism, facilitating dishonesty) is prohibited and will lead to dismissal from the course and referral to College disciplinary procedures.

Statement on collaboration:

Discussion and the exchange of ideas are essential to academic work. For individual essay assignments in this course, you are encouraged to consult with your classmates on the choice of paper topics and to share sources. You may find it useful to discuss your chosen topic with your peers, particularly if you are working on the same topic as a classmate. However, you should ensure that any written work you submit for evaluation is the result of your own research and writing and that it reflects your own approach to the topic. You must also adhere to standard citation practices in this discipline and properly cite any books, articles, websites, lectures, etc. that have helped you with your work. If you received any help with your writing (feedback on drafts, etc), you must also acknowledge this assistance. See group project guidelines for collaboration on the final project.

Assignments

Course events

Please attend three course events this semester. Within 24 hours after the event, please submit a 1 paragraph reflection to your TF by email. You can address any aspect of the event in your response. Questions to prompt your response: After the event, what are you left mulling? What was new to you or particularly fascinating? Was there a point that didn't come up in the talk or discussion that you would like to add? Did you make any connections to course lectures, readings, or discussions? (These are just prompts – you do not need to address all of these questions.)

Written or Multimedia Essays

Complete two essays and turn them in by the deadline for the unit. Detailed guidelines for each assignment will be available on the course website. You are permitted one revision and re-grade on the first essay that you submit.

Unit 1

Due March 2

Conduct, transcribe, and analyze a 45-60 minute interview with a female or LGBTQ scientist.

or

Create a multimedia guide to one of Harvard's archival collections on a woman in the history of science – *see list*.

Unit 2

Due March 30

Read or view a historical science fiction work or video game produced prior to 1990 and offer a close reading and analysis of the dynamics of gender, science, and technology in the work, using course readings and frameworks.

or

Create a multimedia guide to a rare artifact (or collection) in Harvard's science fiction, film, or comics archives – *see list*.

Unit 3

Due April 27

Write a persuasive analytic essay offering your own answer to the question: What can gendered toys tell us about human sex differences?

or

Critically examine the role of gender assumptions in a popularization of a scientific sex difference finding – *see list* of approved popularizations, or propose one.

Guidelines for essays:

Writing guidelines:

- An excellent essay will be persuasive, creative, elegantly written, and show proficiency with central course concepts and methods of analysis
- Advance an original argument or analysis using only your own ideas
- State your thesis clearly
- Use specific examples, quotations, and details to support your argument
- Clean grammar and spelling

Formatting guidelines:

- 5-7 pages of main text

- MS Word .doc or .docx format
- Include complete citations in a consistent, recognized academic citation style of your choice
- References, footnotes, endnotes, and images/figures are not included in page count and should be placed at the end of the document
- Double-spaced
- 12 pt Times New Roman font
- 1 inch margins
- Title your paper
- Name and page number on the upper right header of each page
- Upload to dropbox on the course website

Multimedia essay option:

- Use text (written or spoken) combined with images, sound, video, hypertext, or other media to allow multimodal engagement with the study object
- *Equivalent* of 5-7 pages of main text (3 minute film, 3-5 minute podcast, 8-10 frame cartoon -- confirm with professor)
- 1-2 page (double-spaced) descriptive summary/caption
- Include a *storyboard* detailing your planning and aesthetic choices
- Include complete citations in a consistent, recognized academic citation style of your choice.
- Good models: <http://theoatmeal.com/comics>, <http://thismodernworld.com/>, <http://thesocietypages.org/socimages/>, <http://www.illdoctrine.com/>
- Grading: 65% content; 35% execution; one revision and regrade permitted (on the first two assignments only)

Final Project

Due May 13

The final project for this course invites you to design a creative intervention - artistic, activist, policy, educational, media, business, or other - to transform any aspect of current practices, discourses, or institutions surrounding gender and science issues.

You have considerable freedom in designing this project. Several small assignments are designed to help you develop your project and provide feedback along the way.

Examples of potential projects:

- A virtual library, art or science museum *exhibit* illuminating any aspect of gender in the history, culture, or practice of science using materials from the Harvard collections
- A short film documenting and analyzing gender in popular culture representations of science (model: "Feminist Frequency" on youtube.com)
- A proposal for a new toy to counter gender stereotypes in science to a company

- or product line such as Lego or Mattel
- A grant proposal to the NSF or a private foundation proposing a new program to address a gender and science issue
- A policy brief for a lawmaker proposing a new policy to address a gender and science issue
- A short story, play, or film, graphic/comic book, or chapbook
- A gender-bending rewrite or parody of a classic scene in a science-related short story, play, or film
- A social/viral media project
- A video game (or a design for one)
- A visual or performance art project
- A redesign of a classic experiment in the science of sex and gender differences or sexuality to test or challenge gender assumptions
- Design a survey to ascertain some empirical aspect of women/gender in science experiences (model: Clancy et al. 2014)

Four milestones support the development of your project:

1. **Meet with TF to discuss your final project** (March): Schedule a meeting with your TF to discuss your final project concept. At this stage you need to decide whether you want to work as an individual or in a group. Group projects of 2-6 students are an option. Your TF will provide special guidelines for proposal process and evaluation of group projects.
2. **Project pitch** (April 9): Develop a short oral presentation (3 minutes for individual, 5 minutes for group). Paint a vivid picture of how your project works, how it will transform some aspect of gender-science-tech issues, and how it is innovative, and how it is feasible. In your presentation, name the strongest drawback or objection to your approach and provide an answer to it. Conclude with a strong statement arguing for the importance of your intervention. Your presentation should be confident and verbally fluent. You may use notes, though you may not read word-for-word from them. Props are optional. You may use *at most* one prop (object or image) in your presentation. Time limits are firm. After each pitch, we will invite up to three questions from students in your group. Come prepared to ask incisive questions and offer constructive critiques. Answer questions concisely.
3. **Project proposal** (April 13): ~2-3 page proposal (double spaced). Based on your proposal, your TF may ask for revisions to your project plan. Your proposal should contain the following subheadings (see modifications for group projects below):
 - a. *Project concept*: a vivid, concise proposal for a transformative intervention

- b. *Contribution and audience*: situate your project within the larger scholarly and cultural conversation around gender, science, and technology and describe your intended audience or user
- c. *Resources and materials*: list the resources and materials you will need to develop your project concept into the final poster/exhibit and write-up
- d. *Timeline for project completion*: provide a realistic outline of tasks that shows that your plan is feasible
- e. *Annotated references*: provide at least 4 complete, highly relevant citations for sources that provide critical context and motivation for your project. Under each citation, provide a 1-2 sentence description of the source. You can include non-academic materials, but you should also include academic material that you plan to draw on for theoretical framing. You may cite readings from class. References do not count towards page count.

4. **Final project submission:**

- a. **Project write-up** (due May 12, at midnight the night before the poster session): An 8-10 page double-spaced paper. This paper can take a variety of forms, in agreement with your TF. For example, your write-up might be a *proposal* for a project, policy, research, business, or product; a script or a short story; a literature review and study design for new scientific research; or a critical summary of a completed or proposed film, visual art, or performance art piece. Follow the writing, formatting, and citation guidelines provided for essays for this course.
- b. **Poster or Exhibit** (due in poster session, in exam week 12 slot for this course, May 13): Poster with a clean, clear, readable visual overview of your project and its contributions. Alternatively, designs or mock-ups of products, websites, films, or exhibits may be exhibited along with an accessible one-page written description. Your poster or exhibit will be mounted for 2 hours during the exam slot for this course, and you are asked to stay for the entire time, including standing with your poster for 45 minutes and viewing and engaging with other projects. Posters will be evaluated by TFs during this time window. See design and formatting guidelines for posters and exhibits on the course website.