Syllabus for FYSP 143: Deconstructing Technology, Fall 2012

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OFFICE HOURS: TBA, based on schedule sheets
COURSE MEETING TIMES: Tu/Th 9:30-10:45 am, W209

CONTENT AND GOALS: This seminar will explore the people, science, and industries involved in the making of electronic devices such as computers and cell phones. We will also study some of the impacts of these devices on our environment and society as a whole. We will work with primary and secondary literature sources and gain experience in writing and presenting about technology.

PREREQUISITES: There are no prerequisites for this course, as the relevant technical content will be developed and discussed in class and through assigned reading.

READINGS: There are five required books for the course, but three are available online.
1) available online: Technology Matters: Questions to Live With, David Nye, 2007.
2) The Telephone Gambit: Chasing Alexander Graham Bell's Secret, Seth Shulman 2009.
3) available online: Nanotechnology: the next big idea, Mark Ratner and Daniel Ratner, Prentice Hall, 2003.
4) available online: High Tech Trash, Elizabeth Grossman, Island Press-Shearwater Book, 2006.
5) Prey, Michael Crichton, Harper, 2008.
Additional readings (short excerpts and articles) will be posted on the course Blackboard site. A series of relevant books have been placed on reserve in the Science Library to assist in assignments.

CLASS ACTIVITIES AND ASSIGNMENTS: This class will involve a variety of different activities--some literally deconstructive (taking apart a hard drive) or constructive (making a simple transistor circuit), and others involving more of your mental and verbal participation (reactions to the readings, for instance).

As this is a seminar, not a large lecture class, it is important to **DO** the required reading on a timely basis and to **CONTRIBUTE MEANINGFULLY** to the class discussion. To prod you towards that, I will at least initially ask you to **WRITE OUT** and **EMAIL/HAND IN** answers to some pre-class discussion questions posted on Blackboard; some of them are technical in nature (such as exactly what's the size of data when you buy a terabyte (TB) drive), while others are more your thoughts on a reading (you should be writing paragraphs, not one-liners like "oh, I didn't really like it").

There are four main assignments for the course, along with two in-class presentations.

Assignment 1: Discuss a feature of your electronics ~5 pages double spaced.
Ideas for topic due: Thurs. Sept. 6.
Draft due: Tues. Sept. 11.
Final version due: Thurs. Sept 20.

The readings from *Technology Matters* discuss the inevitability of technological advances and the ability/inability to predict the future or understand the past. Consider these issues in the specific case of an item of importance to you (laptop, cell phone, iPod, etc.) Identify one aspect of one item-a specification that you could find in the manual or off the webpage at Best Buy/Amazon, etc. (Examples: screen resolution on the computer monitor, storage capacity on your iPod, battery life for your laptop, etc.)

In your paper, discuss that specification and describe how it is significant to you in your current usage of the device. Discuss the effects of a ten-fold **decrease** in that factor as well as a ten-fold **increase** (presumably one of these will be more desirous than the other!) What would you be able to do/not do in the future or past, relative to your current practices? Using information on past developments, industry predictions, and other resources you cite, discuss the likelihood and timeframe for a ten-fold improvement in your specification. *Briefly* describe what types of advances might be necessary to achieve such a change. Or is this an example of an unforeseeable advance? How likely is a hundred-fold improvement?

Be sure to cite the references that you use in making your assessments.

Assignment 2: Research a scientist/engineer/group ~10 pages double spaced; accompanying ~10-15 min in-class presentation.
Ideas for topic due: Thurs. Sept. 20.
Draft due: Tues. Oct. 9.
Final version due: Thurs. Oct. 18.
Presentation: either Tues. Oct. 16 or Thurs. Oct. 18.

Following our look into Alexander Graham Bell and Elisha Gray, you will now have an opportunity to investigate closer other people in the business of making electronic devices. Keep in mind our discussions about the unique contributions of individuals vs. the overall pace of the field vs. societal demands or interests in certain advances.

For this assignment, you will identify a single research group-a scientist or engineer or team of them who are performing a set of experiments related to electronic technologies. You are NOT to survey a topic--make sure to concentrate on just the specific efforts of one scientist or team of researchers. You can find your person/people in a variety of ways: start at the web page of a college, university of interest or look through sciam.com, sciencenews.com, etc for a story of some recent development uncovered by someone…

In a ~10 page paper, discuss who they are, where they are, and the conditions under which they work. (i.e. they are at XXX university or at a start-up company or at a national laboratory…) Summarize what type of work they are doing and the problems that they are trying to address. What tools do/did they use to perform the work? Discuss the challenges that they face(d) in doing their work, and the potential payoff or knowledge gained if they are/were successful.

Be sure to cite the appropriate papers or patents or presentations that they have made (i.e. primary literature). In addition to the paper, you will make a short presentation to the class.

Assignment 3: Research a specific development ~10 pages double spaced, 10-15 minute in-class presentation on this, or on assignment 4.
Ideas for topic due: Thurs. Nov. 1
Draft due: Thurs. Nov. 8
Final version due: Tues. Nov. 20
Presentation on this or Assignment 4: Tues. Dec. 11 or Thurs. Dec. 13

For this assignment, you will discuss an area of current electronics research in which scientists and engineers have been making significant advances (which may or may not be anywhere close to commercial realization). As your primary reference, you should find a survey/feature article (>4 pages in length) from a magazine such as Scientific American or Technology Review. Examples from Scientific American include: a June '08 article on multitouch computing, a Feb '08 article on radio-frequency id's, a Dec '07 article on displays.

Using it and related references, write a 10 paper explaining what the development is, how it works, how it represents a change from current practices, and what still needs to be done/future work associated with this topic. **A significant portion of the work for this paper is to be able to understand and explain the technical content connected with your topic.** Be sure to cite your references. You will make a presentation to the class on either this topic or that of assignment 4.

Assignment 4: Research a specific impact (good or bad!) to society ~10 pages double spaced, 10-15 minute in-class presentation on this, or on assignment 3.
Ideas for topic due: Tues. Nov. 27
Draft due: Thurs. Dec. 6
Final version due: at class exam slot: Thurs. Dec. 20 at 11 am.
Presentation on this or Assignment 3: Tues. Dec. 11 or Thurs. Dec. 13

In this assignment, you will discuss a particular manner in which computer electronics has affected society. **Make sure to limit the scope of your topic so that you can discuss it in sufficient detail.** As in Assignment 3, find a survey/feature article (> 4 pages in length, but not an entire book!) to serve as your primary reference. The Scientific American article on RFID's and a specific privacy concern that we read for class is a good example. Some (slightly dated) possibilities from Technology Review:

May/June ’08: Una laptop por nino-- about the ~$100 laptop project to get technology into the hands of children in developing countries or May ’06: Nanoparticle toxins- about the specific hazards of nanoparticles.

Using your primary reference and others, write a ~10 page paper introducing the topic, describing the manner in which current electronics have led to the issue. To what extent are people (government agencies, local activists, corporations, etc) working towards solutions/capitalizing on the benefits of this particular topic? What are the longer term prospects? Again, be sure to cite your sources appropriately. You will make a presentation to the class on either this topic or that of assignment 3.

GRADING: Grading will be based on the four written papers (70%, 10% for the first, 20% for each of the next three), pre-class preparation/in-class participation (20%), and two oral presentations (10%).

ADDITIONAL INFORMATION:

Honor Code: The Honor Code applies to all work in this course, particularly the written papers. Students should write and sign the Honor Code to each paper.

Accommodations for students with disabilities: If you have a disability that you think might impact your performance in this class, please try to contact me as soon as possible. If you prefer not to discuss this, that is fine as well, but in any case, you MUST contact Student Academic Services to get your disability documented before any accommodations can be made.