**INFO 6210 / COMM 6211**

**INFORMATION, TECHNOLOGY, AND SOCIETY**

Department of Information Science

Cornell University

Spring 2017

Mon 1:25-4:25

Gates Hall 114 (and remotely from Cornell Tech)

*[syllabus version: 6 Feb 2017]*

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Office hours: Tuesdays 2:00-4:00, or by appointment

Course website: <http://www.karen-levy.net/teaching/>

**OVERVIEW and GOALS**

This research seminar is a core requirement of the doctoral program in Information Science. This course explores key theoretical and methodological approaches underlying the study of information, technology, and society, focused primarily (though not exclusively) on social science approaches—drawing from disciplines like sociology, communications, history, science & technology studies, and others. The course is designed to be rigorous and to prepare students to make their own analytically and theoretically sound contributions to scholarship about information, technology, and society.

The course has three overarching, and equally important, objectives:

* First, we will explore and evaluate the social, political, economic, cultural, and ethical dynamics that accompany technology “on the ground” (i.e., as it intersects with social life). We’ll focus both on longstanding debates and emerging problems, and look at how they inform each other. The goal is for you to gain historical and theoretical context to think rigorously about the contexts and consequences of information technology, and to inform your own studies thereof.
* Second, we will spend a good deal of time focusing on methods for analyzing these dynamics. We’ll focus critically on analyzing how we know what we know about technology, and spend time examining methodological difficulties and disagreements (and the ethical entanglements that can accompany them).
* Third, we will devote attention to the professional craft of being a researcher and a member of a research community. This means working on the skills of reading analytically, critiquing readings and your colleagues’ works-in-progress constructively, communicating your ideas effectively in writing and orally, generating good research questions and collaborations, and related skills. This might seem like a list of feel-good goals secondary to the substantive material, but it isn’t! Being a good academic neighbor bears directly on the quality and creativity of your own research.

A word of fair warning: this course is designed for students who are pursuing research in information science and broadly related fields. The course is open to non-PhD students, but the course will be taught at the doctoral level, and with this assumption in mind. If you are not doing independent research or preparing to do so very soon, this course might not be a great fit for you. Feel free to come talk to me if you’re on the fence about this!

**COURSE MATERIALS**

Course readings can be downloaded from Blackboard; many are also available via Google Scholar. You don’t need to buy anything.

**ASSIGNMENTS and GRADING**

**A note on grades.** In a course like this one, grades are a sort of necessary evil. I understand that good grades might be instrumentally useful, even essential, to gain you entrée into whatever the next phase of your professional life is, and for that reason (among others) you’ll get a grade in this course. But the fundamental purpose of this course is to equip you to do thoughtful, rigorous, independent analysis. To that end, the goal of each of the following course components is to give you opportunities to hone your analytic abilities, refine your research agenda, and practice skills that will be essential to your professional life.

**Grade breakdown:**

5% Initial self-assessment

20% Critiques (4 x 5%)

15% Presence & contribution (including class facilitation)

35% Research paper (proposal 10%, final 25%)

10% Peer review

15% Conference presentation

**Initial self-assessment.** Level-setting description of you, your methodological and theoretical orientation, your research experience and trajectory, and your particular aims for the course. The goal of this assignment is to give you the chance to reflect on how this course fits into your own development as a researcher, and to give me a better sense of the skills and interests you’re bringing to the class. More details will be given in the first class meeting. Due 12 February.

**Critiques.** Four times during the semester, you’ll prepare a 1-2 page (double-spaced) critique based on the week’s readings. This is ***not*** a summary, a reading response, or a book report; you can safely assume I have read the readings for the week. Rather, you should use these as opportunities to mash up the themes and writings for the week against your own research, ideas, perspective, analysis, interests, etc.; this is a similar skillset to what you’ll bring to critique of your colleagues’ work, and I firmly believe that asking questions like these of course readings will make your own work better.

Here is a non-exhaustive list of some possible approaches:

* Focus on method. How do these researchers know what they know? Do they know what they think they know? What are some other ways of knowing about the thing they’re talking about? How do these researchers operationalize and measure the concepts they are interested in? How might you apply a version of their approach to [thing you care about]?
* Focus on assumptions. What assumptions underlie the research and writing? What theory of the world are these authors working with, and what are they trying to explain? What questions *don’t* they ask? If there are assumptions that you think are faulty or context-dependent, what are they, and how might recognition of them change the conclusions the authors reach?
* Focus on design. How might you redesign a technology, a policy, a norm, or a social structure in light of the ideas/findings in this research? How could you assess the effects of such a redesign? What new issues might it introduce?
* Focus on ethics. What ethical issues are raised by the technology under discussion? What ethical issues are raised by the *research* about the technology? How might either be addressed? What approaches do the authors take (if apparent) to thinking about ethics? Do you find their approaches sufficient?
* Focus on extensions (especially to your own work). How does the research make you reflect differently on your own academic research? Can you “remix” it with work you’re doing to come up with something new? Could you apply it in some other context or generalize it in a different field? Try articulating a mini-proposal for a project you could pursue that relates in some way to the week’s topics/readings.

A few logistical notes on critiques:

* “Critique” doesn’t necessarily mean “critical” in a negative sense; the point is to be analytic, creative, and reasoned, regardless of whether you love or hate something.
* Your critique doesn’t have to involve all the readings for a given week. You can go deep on one paper if you want. That said, synthesis is an important research skill, and you may get more out of the assignment if you try to draw together several of the readings.
* Do not go over the length requirement (brevity is an important academic skill, too!). 1-2 pages double spaced in a standard 12-point font, please.
* Timing: you must do four critiques during the semester (by 24 April), including two no later than week 6 (20 March). Critiques are due by email to me at midnight the night before class, without exception.
* You can’t also do a critique on the week you’re facilitating (see below).

**Presence and contribution.** This component of the grade encompasses your class engagement, attendance, and contribution to a generative course experience. Your contributions to the class can and should occur in our in-person meetings; in addition, we’ll operate a Piazza site on which you can interact with your colleagues to discuss questions and post additional items of interest.

A baseline for contribution to our class is that you will have thoroughly read and engaged with the course materials. I expect everyone to do this for every class session. In addition, you will also be required to serve as a facilitator of our class discussion (with 1-2 colleagues) once during the semester. This means that you will be responsible for leading class discussion during part of one session, and will need to prepare discussion questions for your colleagues in advance. I’ll provide more detail about this component in our first class meeting.

**Research paper.** You will produce a 15-20 page (double-spaced) paper, in lieu of a final exam, that draws out a key theme from the course. I encourage you to use this requirement as a way to further some aspect of your research agenda (e.g.., as a first draft of a paper you could submit to a conference or journal, as a way to explore some facet of your dissertation project, as a means to collect pilot data or test out a method that’s new to you, etc.). We will discuss the paper in more detail as the course progresses, but I encourage you to begin thinking of topics early in the semester; to that end, you’ll be required to submit a 1-page proposal for the project by 31 March at midnight. The research paper should be based on independent thinking and research, and should draw on sources from outside class as well as inside class. The paper itself will be due on 20 May at midnight.

**Peer review.** A key component of academic life is learning how to give constructive, generative feedback to colleagues. This is just as important a skill as developing your own research ideas (and often, they go hand-in-hand!) and the goal of this assignment is to practice that skill. You will be asked to provide feedback for two of your colleagues’ research proposals, in the style of conference- or journal-style peer review, with the goal of making their work better. We’ll talk more specifically about how to provide genuinely helpful peer review before the assignment. Due 9 April by midnight (via email to me and your reviewees).

**Conference presentation.** In the final two weeks of class, you’ll give a 10-minute oral presentation about your research-paper-in-progress, in the style of a presentation you might give at an academic conference or workshop, to be followed by class feedback. The goals of this assignment are to practice communicating about your work clearly and succinctly, and to generate useful feedback from your colleagues.

**ACADEMIC INTEGRITY**

You are expected to observe Cornell’s Code of Academic Integrity in all aspects of this course. The code states that:

Absolute integrity is expected of every Cornell student in all academic undertakings. ... Academic integrity is expected not only in formal coursework situations, but in all University relationships and interactions connected to the educational process, including the use of University resources. ... A Cornell student's submission of work for academic credit indicates that the work is the student's own. All outside assistance should be acknowledged, and the student's academic position truthfully reported at all times. In addition, Cornell students have a right to expect academic integrity from each of their peers.

Among other duties, academic integrity requires that you *properly cite any idea or work product that is not your own*, including the work of your classmates or of any written source. If in any doubt at all, cite! If you have any questions about this policy, please ask me.

**WEEKLY SCHEDULE**

**(subject to change)**

**Week 1 6 Feb Welcome**

No advance reading.

**Week 2 13 Feb Tech Ethics and the Political Moment**

**\* Self-assessment due by midnight before class \***

Winner, Langdon. “Do Artifacts have Politics?” *Daedalus* (1980): 121-136.

Seltzer, William, and Margo Anderson. “The Dark Side of Numbers: The Role of Population Data Systems in Human Rights Abuses.” *Social Research* 68.2 (2001): 481-513.

Dillard, Jesse F. “Professional Services, IBM, and the Holocaust.” *Journal of Information Systems* 17.2 (2003): 1-16.

Latonero, Mark and Zachary Gold. “Data, Human Rights, & Human Security.” Data & Society Primer, 22 Jun 2015. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2643728>

Latonero, Mark. “An App to Save Syria’s Lost Generation?” *Foreign Affairs*, 2016 May 23. <https://www.foreignaffairs.com/articles/syria/2016-05-23/app-save-syrias-lost-generation>

Narayanan, Arvind and Bendert Zevenbergen. 2017. “Case Study: No Encore for Encore? Ethical Questions for Web-Based Censorship Measurement.” Council for Big Data, Ethics, and Society. 2017. <http://bdes.datasociety.net/council-output/case-study-no-encore-for-encore/>

**[break]**

**Week 3 27 Feb Rules and Regulation**

Latour, Bruno. “Where Are The Missing Masses? The Sociology of a Few Mundane Artifacts.” In *Shaping Technology/Building Society: Studies in Sociotechnical Change* (W. Bijker and J. Law, eds.). MIT Press: pp. 225-58.

Lessig, Lawrence. *Code 2.0*. Basic Books (2006): Ch. 7.

Zittrain, Jonathan L. *The Future of the Internet and How to Stop It.* Yale University Press (2008): Ch. 5.

Radin, Margaret. “Regulation By Contract, Regulation By Machine.” *Journal of Institutional and Theoretical Economics* 160.1 (2004): 142-56.

Rich, Michael L. “Should We Make Crime Impossible?” *Harvard Journal of Law and Public Policy* 36 (2013): 795-848.

**Week 4 6 Mar Evaluation and Prediction**

Espeland, Wendy Nelson, and Mitchell L. Stevens. "A Sociology of Quantification." *European Journal of Sociology* 49.03 (2008): 401-436.

Bouk, Dan. *How Our Days Became Numbered: Risk and the Rise of the Statistical Individual*. University of Chicago Press (2015). Ch. 2.

David, Shay, and Trevor Pinch. “Six Degrees of Reputation: The Use and Abuse of Online Review and Recommendation Systems.” *First Monday* 11.3 (2006). <http://firstmonday.org/ojs/index.php/fm/article/view/1315>

Harcourt, Bernard E. *Against Prediction: Profiling, Policing, and Punishing in an Actuarial Age.* University of Chicago Press (2007). Prologue and Ch. 1.

**Week 5 13 Mar Complexity and Systemic Risk**

Perrow, Charles. *Normal Accidents: Living With High-Risk Technologies.* Princeton University Press, 1984: chapters 1 and 3.

Vaughan, Diane. “Autonomy, Interdependence, and Social Control: NASA and the Space Shuttle Challenger.” *Administrative Science Quarterly* 35 (1990): 225-257.

Karppi, Tero, and Kate Crawford. “Social Media, Financial Algorithms, and the Hack Crash.” *Theory, Culture, & Society* 33.1 (2016): 73-92.

Etzioni, Oren. “No, The Experts Don’t Think Superintelligent AI is a Threat to Humanity.” *MIT Technology Review*, 2016 Sep 20. <https://www.technologyreview.com/s/602410/no-the-experts-dont-think-superintelligent-ai-is-a-threat-to-humanity/>

Dafoe, Allan, and Stuart Russell. “Yes, We Are Worried About the Existential Risk of Artificial Intelligence.” *MIT Technology Review*, 2016 Nov 2. <https://www.technologyreview.com/s/602776/yes-we-are-worried-about-the-existential-risk-of-artificial-intelligence/>

**Week 6 20 Mar Users and Risk Allocation**

**\* at least 2 critiques completed by this class \***

Kline, Ron, and Trevor Pinch. “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States.” *Technology and Culture* 37(4) (1996): 763-795.

Levy, Karen E.C. “The User As Network.” *First Monday* 20.11 (2015).

Shamir, Ronen. “The Age of Responsibilization: On Market-Embedded Morality.” *Economy and Society* 37(1) (2008): 1-19.

Olen, Helaine. “The Quest to Improve America’s Financial Literacy is Both a Failure and a Sham.” *Pacific Standard* (2014).

Elish, M.C. “Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction.” Working Paper presented at WeRobot 2016. <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2757236>

**Week 7 27 Mar Bias and Fairness [1]**

Cowan, Ruth Schwartz. *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave*. Basic Books (1983): Chapter 3.

Weber, Rachel N. “Manufacturing Gender in Commercial and Military Cockpit Design.” *Science, Technology, & Human Values* 22(2) (1997): 235-253.

Sweeney, Latanya. “Discrimination in Online Ad Delivery.” *Communications of the ACM* 56(5) (2013): 44-54.

Doleac, Jennifer L., and Luke C.D. Stein. “The Visible Hand: Race and Online Market Outcomes.” *The Economic Journal* 123.572 (2013): F469-F492.

Ananny, Mike. “The Curious Connection Between Apps for Gay Men and Sex Offenders.” *The Atlantic*, 2011 Apr 14. <http://www.theatlantic.com/technology/archive/2011/04/the-curious-connection-between-apps-for-gay-men-and-sex-offenders/237340/>

**\* research proposal due by midnight 31 Mar \***

**[break]**

**Week 8 10 Apr Bias and Fairness [2]: two deep dives**

**\* peer review due by midnight before class \***

[Half of the class will read each group of readings carefully and skim the other group.]

*Group 1: on language and bias:*

Bolukbasi, Tolga, Kai-Wei Chang, James Zou, Venkatesh Saligrama, and Adam Kalai. “Man is to Computer Programmer as Woman is to Homemaker? Debiasing Word Embeddings.” 2016. <https://arxiv.org/pdf/1607.06520v1.pdf>

Caliskan-Islam, Aylin, Joanna J. Bryson, and Arvind Narayanan. “Semantics Derived Automatically From Language Corpora Necessarily Contain Human Biases.” 2016. https://arxiv.org/pdf/1608.07187v2.pdf

* AND watch the presentation of the above two papers in this video, including Q&A (from beginning until 1h09m): <http://www.fatml.org/schedule/2016/presentation/semantics-derived-automatically-language-corpora>

*Group 2: on risk scores and recidivism:*

Angwin, Julia, Jeff Larson, Surya Mattu, and Lauren Kirchner. “Machine Bias: Risk Assessments in Criminal Sentencing.” *ProPublica*. 2016. <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>

* AND supporting materials: “How We Analyzed the COMPAS Recidivism Algorithm” <https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm>

Kleinberg, Jon, Sendhil Mullainathan, and Manish Raghavan. “Inherent Trade-Offs in the Fair Determination of Risk Scores.” 2016. <https://arxiv.org/pdf/1609.05807v2.pdf>

Corbett-Davies, Sam, Emma Pierson, Avi Feller, and Sharad Goel. “A Computer Program Used for Bail and Sentencing Decisions Was Labeled Biased Against Blacks. It’s Actually Not That Clear.” *Washington Post* 2016 Oct 17. <https://www.washingtonpost.com/news/monkey-cage/wp/2016/10/17/can-an-algorithm-be-racist-our-analysis-is-more-cautious-than-propublicas/>

**Week 9 17 Apr Labor and Capital**

Braverman, Harry. *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century.* Monthly Review Press (1974): Chs. 2 and 4.

Barley, Stephen. “Technology as an Occasion for Structuring: Evidence from Observations of CT Scanners and the Social Order of Radiology Departments.” *Administrative Science Quarterly* 31 (1986): 78-108.

Levy, Karen E.C. “The Contexts of Control: Information, Power, and Truck-Driving Work.” *The Information Society* 31 (2015): 160-74.

Irani, Lilly C., and M. Six Silberman. “Turkopticon: Interrupting Worker Invisibility in Amazon Mechanical Turk.” *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 2013.

Kingsley, Sara Constance, Mary L. Gray, and Siddharth Suri. "Accounting for Market Frictions and Power Asymmetries in Online Labor Markets." *Policy & Internet* 7.4 (2015): 383-400.

**Week 10 24 Apr Transparency and Accountability**

**\* 4 critiques completed by this class \***

Burrell, Jenna. “How the Machine ‘Thinks’: Understanding Opacity in Machine Learning Algorithms.” *Big Data & Society* 3.1 (2016): 1-12.

Diakopoulos, Nicholas. “Accountability in Algorithmic Decision Making.” *Communications of the ACM* 59.2 (2016): 56-62.

Ananny, Mike, and Kate Crawford. “Seeing Without Knowing: Limitations of the Transparency Ideal and Its Application to Algorithmic Accountability.” *New Media & Society* (2016): 1-17.

Levy, Karen E.C. and David Merritt Johns. “When Open Data is a Trojan Horse: The Weaponization of Transparency in Science and Governance.” *Big Data & Society* 3.1 (2016): 1-6.

Sandvig, Christian, Kevin Hamilton, Karrie Karahalios, and Cedric Langbort. [“Auditing Algorithms: Research Methods for Detecting Discrimination on Internet Platforms.”](http://www-personal.umich.edu/~csandvig/research/Auditing%20Algorithms%20--%20Sandvig%20--%20ICA%202014%20Data%20and%20Discrimination%20Preconference.pdf) ICA Preconference on Data and Discrimination: Converting Critical Concerns into Productive Inquiry, 2014 May 22.

**Week 12 1 May Presentations**

**Week 13 8 May Presentations**

**\* research paper due by midnight 20 May \***