THE HISTORY OF BIG DATA

Professor Rachel Knecht | HIST153a
Course Meeting: Mondays & Wednesdays, 3:30-4:50pm in Shiffman 201
Office Hours: Wednesdays 11am-1pm in Olin-Sang 217

COURSE DESCRIPTION

Where did “big data” come from? We may think of the explosion of quantitative information about our lives, habits, and societies as being a very recent phenomenon, but in fact, people have been counting things for a long time. Studying the history of quantification—how a thing gets a number attached to it, who gets to do that, and for what reason—can shed light on the use and misuse of numbers and teach us to more thoughtfully approach our own quantified lives. Beginning with the invention of the mathematical proof and ending in our algorithmic present, this course will explore the ways in which numbers and calculation have historically shaped politics, society, and the economy, as well as our collective understanding of what is knowable or true. We will ask: how are things, people, and ideas turned into numbers? What information gets lost when they are? And is numerical objectivity really attainable?

Course readings will delve into the intertwined histories of science, mathematics, and society. Students will consider the role of global political events like the French Revolution and the Cold War; changing ideas about religion and knowledge; issues surrounding free and unfree labor; the nature of statistical citizenship; the interdependence of numbers and empire; and the rise of mathematical experts, to better understand the changing social role of numbers. The course aims to encourage students across all disciplines to learn how the historical processes of assigning numbers to people, things, and ideas have shaped the development of both science and society over the last three centuries.

Course Goals and Objectives: By the end of the course, students will be able to:

1. Think through and articulate the way that numbers and numerical truth have been created or influenced by historical ideas, events, and structures;
2. Articulate, in both oral and written form, the ways that historical contingency has affected the development of scientific truth or objectivity; and
3. Apply historical thinking skills to present-day questions of numerical knowledge creation, “big data,” and the politics of truth.
**Course Hours:** For this course, students seeking to maximize their learning should expect to spend 180 hours: 35 hours in class (13 weeks, 160 minutes); 65 hours reading (5-6 hours each week); 20 hours on their source analysis, 20 hours studying for their midterms; and 40 hours on their final paper. Both the total time and this distribution will certainly vary by student and will not be monitored by myself or Brandeis.

**COURSE POLICIES**

**REQUIRED READING MATERIALS:**

The following **books** will be available at the bookstore and either on hold at the Brandeis Library or available online. They can also be purchased at the retailer of your choice.

**Required Books:**


**All additional readings** for the course will be available on the LATTE page under *Course Readings*. It is imperative that you stay up to date on the reading assignments, and that you come prepared to class to talk about all of the day’s assigned readings.

**GRADED ASSIGNMENTS:**

Students will be evaluated on two take-home examinations and one final paper, as well as their weekly preparedness for class. Grades will be distributed as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Grade Portion</th>
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</thead>
<tbody>
<tr>
<td>Source Analysis</td>
<td>By April 17, 5pm</td>
<td>20%</td>
</tr>
<tr>
<td>First Midterm Exam</td>
<td>February 27, 5pm</td>
<td>15%</td>
</tr>
<tr>
<td>Second Midterm Exam</td>
<td>April 10, 5pm</td>
<td>20%</td>
</tr>
<tr>
<td>Final Paper</td>
<td>May 10, 5pm</td>
<td>25%</td>
</tr>
<tr>
<td>Thoughts &amp; Questions</td>
<td>Weekly, Mondays at 10am</td>
<td>10%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>Weekly, in class</td>
<td>10%</td>
</tr>
</tbody>
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**Source Analysis:** Students will choose one secondary reading from the course and write an essay of 4-6 pages (~1,500 words) analyzing the text. What is the author’s argument? What sources does she use? What do you see as the strengths and weaknesses of the argument? The purpose of this paper is to practice skills that you will need in any career: absorbing information, organizing your thoughts, and presenting your analysis clearly and efficiently.

**Mid-term Exams:** Students will be given two take-home exams during the semester. The questions will be distributed at the end of class on Monday and will be due 48 hours later on Wednesday evening (Class will not be held on the Wednesdays that the exams are due). These exams are intended to check that everyone is keeping up with the reading and for
students to practice articulating their thoughts on both individual readings and tying a few different weeks together. The second exam is weighted slightly more heavily than the first because it covers more material, and with the aim of rewarding improvement.

**Final Paper:** For the final assignment of the course, students will be given a choice of prompts about which to write a paper of 6-8 pages (double-spaced). This paper will not require any outside research beyond the materials assigned for class. Instead, students should explore a particular theme from the course, bringing together texts from different eras, geographies, or subjects, to explain some aspect of the history of knowing.

Research Paper Option: Students also have the option of writing a 12-15 page research paper instead of the final assignment. Those students who are interested in this option should speak to me some time during the first half of the semester. These students will write a 3-5 page research proposal instead of taking the second midterm.

**LATTE Forums:** Before each class, you will contribute to a forum discussion on the LATTE page responding to the week’s readings. There will be a prompt question for you to answer, but you should consider this a place to express your thoughts or ask questions about the day’s readings. On the forum, you will have the option of responding to a classmate or starting your own thread; both are equally valid. To get credit for your post, you must submit it by 8pm the night before class. I expect you to contribute as often as you are able, but to receive a passing grade, you must submit at least eighteen on-time responses.

**Class Participation:** Participation will be a key component of the course. Keep in mind that attendance in class is mental as well as physical. I ask that you do all the assigned readings and come to class prepared to listen and respond to your peers. If you agree with something stated, build off it with your own analysis. If you disagree, pose a constructive challenge. If you are shy or otherwise have trouble speaking up in groups, please come talk to me and we will find a way for you to participate fully, so you can get the most out of the class.

**ADDITIONAL CLASS POLICIES**

- To pass the course, students must consistently come prepared for discussion and turn in every assignment. Three absences will be excused; more than that will result in a half letter grade being docked from the final grade.
- If you are a student with a documented disability on record at Brandeis and wish to have a reasonable accommodation made for you in this class, please see me in my office right away so that we can set up the appropriate accommodations.
- Barring special accommodation, **students will keep laptops closed and phones off during class meetings.** The temptation to surf the web is irrepressible, and distracts not only you, but everyone sitting around you. Additionally, please do not record lectures or discussions without first getting permission from me.
- You are expected to be honest in all your academic work. Please consult Brandeis University Rights and Responsibilities for all policies and procedures related to academic integrity. Allegations of alleged dishonesty can include a failing grade for the course and/or suspension from the university. Course assignments will include citation guidelines, but you may also consult me or the LTS Library Guides.
- Course communication will occur in class and via email. Should there be any changes to the schedule (such as in the case of school cancellation), I will send out a revised syllabus via email. The syllabus and assignments will be handed out in class as well as posted on the LATTE course website. Students are always welcome to come talk to me during my office hours; no appointment is necessary.

- **Late assignments** will be docked half a grade and then lose an additional half grade every twenty-four hours. I am happy to provide an extension on any assignment to students **who ask for one more than forty-eight hours in advance of the deadline**. Once an extension is granted, the late penalty will apply to the new deadline.

**COURSE SCHEDULE**

January 16: Where did “big data” come from?

January 22: Telling a History of Numbers  

January 23: Numbers in the Ancient World  

January 28: Census-Taking and State Power  

January 30: Numbers, Trade, and Capital  

February 4: Part 1—Experiment & Measurement  

February 6: Part 2—Religion, Politics, & Mathematics  
February 11: Enlightenment Calculations

February 13: Capital Calculations

February 25: Calculating Engines

February 27: No Class, First Midterm Due

March 4: The Rise of Statistical Thinking

March 6: Numbers & Race Science

March 11: The Efficient Household

March 13: Progressive Reform by Numbers

March 18: Imperial Numbers
Reading: Peter Galison, *Einstein’s Clocks and Poincaré’s Maps*, all.

March 20: Measuring the Economy
March 25: The Rise of Social Science

March 27: Numerical Normality
Reading: Sarah Igo, The Averaged American, pp. 191-299

April 1: The Rise of Computing
Also WATCH Hidden Figures (2016)

April 3: No Class, Second Midterm Exam Due

April 8: Education That Counts

April 10: The New Math
Readings: Christopher J. Phillips, The New Math, all

April 15: The Question of Privacy

April 17: The Internet Age
Last Day to Turn in Source Analysis

April 29: Algorithms and Society

May 1: The Future of Numbers

May 10: Final Paper Due