

CARNEGIE MELLON UNIVERSITY
HEINZ COLLEGE

94806 – PRIVACY IN THE DIGITAL AGE

Spring 2017

Syllabus

Instructor:

Veronica Marotta

vmarotta@andrew.cmu.edu

Office: Hamburg Hall 3020

TEXTBOOKS

All readings (both required and recommended) are available on Blackboard.

OBJECTIVES and DESCRIPTION

The main objective of this course is to provide **an informed and critical view of the role and value of privacy in the digital age**. Privacy is a complex and multi-faceted concept. This course combines technical, economic, legal, psychological, ethical, and policy perspectives to present a **holistic view** of its role and function in the digital age.

The reduction of the cost of storing and manipulating information has led organizations to capture increasing amounts of information about individual behavior. New trade-offs have emerged for parties involved with privacy-enhancing or intrusive technologies: individuals want to avoid the misuse of the information they pass along to others, but they also want to share enough information to achieve satisfactory interactions; organizations want to know more about the parties with whom they interact, but they do not want to alienate them with policies deemed as intrusive. Is there a “sweet” spot that satisfies the interests of all parties? Is there a combination of technological solutions, economic incentives, and legal safeguards that is acceptable for the individual and beneficial to society?

This course tries to address the above questions. In particular, the course begins by comparing early definitions of privacy to the current information-focused debate. It then focuses on

- technological aspects of privacy (privacy concerns raised by new IT such as the Internet, wireless communications, and computer matching; tracking techniques and data mining; privacy enhancing technologies and anonymous protocols, ...),
- economic aspects (economic models of the market for privacy, financial risks caused by privacy violations, the value of customer information, ...),
- legal aspects (laissez-faire versus regulated approaches, US versus EU legal safeguards, ...),
- managerial implications (the emerging role of Chief Privacy Officers, compulsory directives and self-regulative efforts, ...), and
- policy aspects (trade-offs between individual privacy rights and societal needs, ...)

Again, a key word from the above description is “holistic.” This term refers to the fact that we will try to cover **different angles** of the privacy debate, and we will try to connect and contrast each angle to the others. The approach of this class therefore somewhat privileges breadth over depth (while offering tools and directions for more

focused analysis), in order to give you a broad and varied understanding of privacy problems in a networked digital society. (For this reason, this class also provides some preparation and introduction for/to other courses you may take at the Heinz School.)

Finally, the intention of the class is not to scare you into believing that every instance of information disclosure is a privacy invasion. Instead, the goal is to educate you about the kinds of information that may be gathered about individuals, and to help you determine the individual and societal trade-offs associated with accepting or avoiding its collection and/or use. Since privacy is a very subjective and contextual feeling, what may be a privacy invasion for you in one setting may not be in another. The challenge we present to you in this course is to understand the difference.

GRADING

The course consists of a combination of readings, assignments, and class discussions. Assignments include homework assignments and a final report.

Specifically, your grade will depend on the following components:

1. Participation in discussion board on Blackboard	10%
2. Homework Assignments	55%
3. Final Report	35%

1. Participation in discussion board on Blackboard:

You will find a discussion board called 'Discussion Forum' on Blackboard. This forum is for you to interact with your classmates as well as the TAs and the instructor. You are highly encouraged to use this forum to discuss the readings, exchange ideas, discuss topics relevant to this course, ask questions about the course and help answer questions that your classmates might have posted. 10% of your final grade will be based on your level of activity on this discussion forum.

Periodically, the Instructor and/or the TAs will post topics of discussions and you are strongly invited to participate in the conversation.

Participation will be evaluated based on the quality of your interventions (and not merely the quantity – posting a lot of posts that are not very relevant or meaningful will not help your grade).

2. There will be three homework assignments. Homework assignments are available on Blackboard. Homework assignments should be submitted via Blackboard as a Word document or Pdf file. Please remember to name your file in the format: YourAndewID_HW#.

Homework assignments consist of short reports (with a predetermined maximum number of pages) and/or analyses of topics related to different parts of the course:

1) privacy technologies; 2) privacy law; 3) economics of privacy. Homework assignments will be graded based on the clarity and validity of your arguments and analysis. You can use the **Objectives Rubric** attached at the end of this syllabus as a guideline to these criteria.

Some tips about how to complete a good assignment:

1. Think about the problem presented and described in the exercise.
2. Collect information about it.
3. Think about the problem again after you have studied the information collected.
4. Give a coherent structure to your ideas:
 - Keep in mind clarity, concision, intellectual rigor, novelty, critical thinking, and analytical discussion.
5. Write down your ideas, remembering to cite collected information in a **properly formatted bibliography**. I provide examples of how to cite sources and format a bibliography in a document I uploaded to Blackboard called "References and Bibliography". **The short version of the story is this: you should use a proper citation scheme, such as the Chicago Manual of style (http://www.chicagomanualofstyle.org/tools_citationguide.html).** You are of course welcome to use any other proper format. Each source must include at least: name, title, date, and publication such as journal or book. (Please note: while Wikipedia is a wonderful source of information it is NOT considered a proper source and should therefore not be cited in your work.)
6. Edit and proofread your text.

Please check carefully the schedule of HWs in the latter part of this document.

3. The final report consists of an in-depth discussion of the privacy aspects and implications of a specific technology, service or product of your choice. Try to pick a very specific technology/product: for example, you can choose "Fitbit" or "Apple Watch" as your topic but you cannot choose "activity trackers" because that is too broad.

The final report should be between 8 to 15 pages long (including final bibliography and figures) and it can be completed individually or in a team up to 3 students.

We want to ensure that you are doing new research as part of this final presentation, and not simply re-submitting the research that you have done for any of your three homeworks. In order to ensure this, we ask that you select a topic that you have NOT studied in any of the three homeworks.

Around mid-way through the course, you will be asked to email the TAs and the Instructor your selected topic. If you have a hard time coming up with a topic, please let us know and we will help you.

More information about the Final Report will be uploaded on Blackboard.

A NOTE ABOUT CITATIONS IN YOUR HWS AND PROJECTS

It is important to cite (and, in fact, properly cite) all sources in your HWs. Citations and references help you build on existing work (so you don't have to repeat what is already known), demonstrate your awareness of current literature, and support your arguments. They also help avoid you accidentally copying other people's work.

You are of course welcome to use any proper format and each source must include at least: name, title, date, and publication (journal/book). While Wikipedia is a wonderful source of information it is NOT considered a proper source and should therefore not be cited in your work. Also, the lecture videos/slides are also NOT considered a proper source and should not be cited in your work. You will need to identify and properly cite the primary source (such as research papers, books, news articles etc.) for any definition/claim/finding that you state in your HWs and final presentation.

ADDITIONAL RESOURCES

For additional assistance with the written or oral communication assignments in this class, you can visit the Global Communication Center (GCC) at CMU. GCC tutors can provide instruction on a range of communication topics and can help you improve your papers and presentations. The GCC is a free service, open to all students, and located in Hunt library.

You can make tutoring appointments directly on the GCC website: <http://www.cmu.edu/gcc>.

You may also visit the GCC website to find out about communication workshops offered throughout the academic year

(<http://www.cmu.edu/gcc/workshops/index.html>).

FINAL ADVICE

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college

experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at <http://www.cmu.edu/counseling/>. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.

COURSE SCHEDULE AND TOPICS

Lecture 1

Topic: Introduction

Today's Reading: None

Lecture 2

Topics: Privacy, Security, and Anonymity

Today's Readings:

Warren and Brandeis¹

Solove - Arguments

Solove - Taxonomy

Posner²

Lecture 3

Topic: Privacy Intrusive Technologies

Today's Readings: Froomkin (Section I only)³

NYTimes

Lecture 4

Topic: Privacy Technologies - I

Today's Readings: Agre, Introduction and Chapter 4

Goldberg_97⁴

Lecture 5

Topic: Privacy Technologies – II

Today's Readings: Claessens

Reiter

Chaum - Mix⁵

Lecture 6

Topic: Privacy Technologies- III

Today's Readings: Same as for previous class

¹ OK, this class has lots of readings, so it is ok if you actually split the readings between Wednesday and the following Monday.

² Also recommended: Agre.html, Serjantov, Agre, Chapter 1, Sweeney, Stanford, Cameron.

³ Also recommended: Swire, Frontline, Guttman, Narayanan, Calo.

⁴ Also recommended: Goldberg, Jiang, Agre, Chapter 9, Juels, Sheng, Garfinkel.

⁵ Also recommended: Chaum – Identification, Zeroknowledge, Low, Brin.

Homework 1 on Privacy Technologies due by Sunday, April 2nd at 11:59pm

Lecture 7

Topic: Privacy and the Legal System: US
Today's Readings: Froomkin (Sections II and III)
Agre, Chapter 7⁶

Lecture 8

Topic: Comparative Legal Approaches to Privacy and Self-Regulation
Today's Readings: Samuelson^{7,8}

Homework 2 on Privacy Regulation due by Sunday, April 16th at 11:59pm

Lecture 9

Topic: Privacy and Economics I: The Market for Privacy
Today's Readings: JEL

Lecture 10

Topic: Privacy and Economics II: The Market for Data
Today's Readings: Rubin^{9,10}

Lecture 11

Topic: Privacy and Online Social Networks
Today's Readings: Wilson¹¹

Homework 3 on Economics of Privacy due by Sunday, April 30th at 11:59pm

Lecture 12

Topic: Psychology and Behavior
Today's Readings: Science
Acquisti (Immediate Gratification)
Brandimarte¹²

⁶ Also recommended: Prosser, Littman, Mell, Solove-FTC, FTC v. Wyndham.

⁷ This article is LONG – you are strongly advised to start reading it early...

⁸ Also recommended: Presler-Marshall, FTC, EU Directive, EU Impact, Culnan, Epic, Schwartz, Duncan, Romanosky, PRC_FIP, Romanosky_Breaches.

⁹ Warning: also this article is very long – start reading it early.

¹⁰ Also recommended: Varian, Gellman, Smith, Perrig.

¹¹ Also recommended: Gross, Acquisti, boyd, Frontline_growing_up_online.

Lecture 13

Topic: Corporate Privacy and CPOs

Today's Readings: Stewart
EPIC¹³

Final reports due by Sunday, May 14th at 11:59pm

¹² Also recommended: Odlyzko, Shostack, Schneier_essay, Syverson, John, Leslie.

¹³ Also recommended: USPTO, HIPAA.

Objectives Rubric

Performance Element	Sophisticated	Competent	Not Competent
Conduct Research	Uses multiple sources, successfully locate appropriate and important information. When information is unavailable, explain the process done to try and locate the information.	Use multiple sources, successfully locate a few pieces of appropriate information but overlook at least one key piece of information. If not available, note that the necessary information is unavailable.	Use a source to locate some information successfully but overlook more than one key piece of information.
Calculations and/or Evaluation	Make all calculations and/or qualitative evaluations accurately. In-depth interpretation of results individually as well as an integrated whole. Makes logical assumptions but only when necessary and which are clearly explained.	Makes all calculations and/or qualitative evaluations accurately. Interpret results individually. Makes assumptions when necessary which are clearly explained.	Does not make all calculations and/or qualitative evaluations accurately. Limited interpretation of results OR make errors in calculations. Interpret results in isolation (individually). Makes illogical assumptions when not necessary or does not answer question because data is not readily available.
Completeness	Covers all questions. Proper discrimination used in including information on important related issued. No superfluous information included. Includes all proper attribution. When information is not available, a report of research done is provided. Reference to previous answers when necessary in answering subsequent questions with little or no repetition.	Covers all questions making it clear what issue is being addressed. Includes attribution. Explains when information is not available to answer question. Refers to parts of previous answers when necessary in answering subsequent questions.	Covers most questions but may answer multiple questions together without distinguishing which question is being addressed. Includes unnecessary information. Does not include reference to research.
Draw Conclusion	Uses information to draw logical conclusion. Supports conclusion with well thought out calculations and facts. Distinguish what the important facts are. Relate Analysis to topics discussed in class or in current events.	Uses information to draw logical conclusion but the conclusion is not clearly supported by data or some data is not accounted for by the conclusion.	Draws no conclusion or draws a conclusion that is not logical. Does not support conclusion with research and prior argument.
Clarity and Presentation of Written Expression	Expresses ideas clearly in own words, being careful not to duplicate presentation of the references; direct quotes held to a minimum. No spelling errors. Grammatically correct. Written report has professional appearance using graphics when appropriate which are referred to and explained in write up.	Expresses in own words, not duplicating language of the references; a few direct quotes but not excessive reliance on the language of research. Very few spelling or Grammatical errors but ideas are still clearly understandable. Written report has neat professional appearance.	Relies heavily on the words of references to present the argument. Many spelling & grammatical errors which interfere with readers' ability to understand. Written report does not appear professional. Includes no graphs, charts etc when appropriate or includes graphs and charts that are not referred to or are inappropriate.
Conciseness and Organization	Contains clearly developed ideas in a logical sequence. Completely answers all questions without unnecessary information. Refers to pertinent information already presented with little or no repetition of information.	Contains clearly developed ideas in a logical sequence. Completely answers all questions but may contain unnecessary information. Does not refers to pertinent information presented in earlier questions or part of analysis.	Is disorganized and difficult to follow. May not be complete. Repeats information unnecessarily.

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