INLS 201
Foundations of Information Science

Course Objectives

From the SILS catalog:

INLS 201 – Foundations of Information Science: Examines the evolution of information science; information representation, organization and management; search and retrieval; human information seeking and interaction; organizational behavior and communication; policy, ethics and scholarly communications.

What that means in terms of this class:

The field known as "information science" involves the representation, storage, organization, retrieval and use of…well, "information"! But what is this "information"? This is a surprisingly complex question. If we think about some of the things that we might describe as "information"—documents like this syllabus, Web pages, photographs, tweets, books, podcasts, results of Google searches, event flyers stuck on telephone poles, the number of steps that is recorded by a Fitbit each day, Egyptian hieroglyphics painted on pyramid walls, text messages, video from surveillance cameras—these constitute an immense variety of form (images, text, video, sound) modality (digital pixels, physical paint) and access mechanism (to see an event flyer, you need to walk past it; to receive a text message, you need a smartphone). There are vast technical challenges to managing all of these diverse objects. Still, the technical aspects of information management are relatively concrete.

But there's yet another level to our understanding of information. What do all these different types of informational messages have in common? They are only useful when people decode them—when we understand what they mean. While the technical challenges associated with information management are significant, the challenges associated with meaning and interpretation are even more vexing. Questions of meaning are inherently uncertain, ambiguous, and contextual.

Information science, then, requires thinking on multiple levels. There is the conceptual level of understanding how messages come to acquire meaning and value, and there is the technical level of understanding how messages can be manipulated to enable practical goals. These conceptual and technical levels are tightly integrated and can't be understood in isolation. For example, we find it natural to look for information based on its topic, or its aboutness. But aboutness is a human judgment of meaning. While we can develop technical solutions to automate document retrieval that operate on relatively concrete document properties, such as word frequencies, these apparently concrete technical solutions are only approximations for human interpretive judgments. If we want to understand both the capabilities and limitations of technical solutions for information-related processes, we need to think about how people produce meaning, as well as about how computers can manipulate information objects.

In this course, we will examine conceptual and technical foundations of representing, organizing, retrieving, and using information. We will emphasize how the conceptual and technical bear upon each other. We will also explore how these integrations and frictions manifest in contemporary life.

The course is roughly organized into three parts. The first and third parts are more conceptually oriented, and the second part is more technically oriented.

- **Part 1** looks at core ideas of meaning, representation, and categorization.
- **Part 2** looks at mechanisms for modeling information computationally, to automate our interactions with information. (Our emphasis here is on understanding these mechanisms at a fundamental level, and not on implementing them.)
- **Part 3 l**ooks at the effects of such computational models, and their associated emphasis on ranking and rating, in contemporary life.

Learning objectives

At the end of this course, you will:

- Be familiar with fundamental concepts and concerns associated with information studies.
- Be able to relate these concepts and concerns to current events, situations, and technologies.
- Be prepared to succeed in further SILS coursework.

Grading

Students will be assessed based on the following elements:

- Three take-home exams for 100 points each
    - Midterm 1: Distributed: February 4 / Due: February 13 (in-class)
    - Midterm 2: Distributed: March 18 / Due: March 27 (in-class)
    - Final: Distributed: April 17 / Due: April 29 @8am (Sakai)
- Participation: 100 points
    - 40 points – Blogging (4 blog entries throughout the semester for 5 points each, comment on 4 blog entries for 5 points each)
    - 60 points – In-Class Discussion (12 guided in-class discussions for 5 points each)

There is a total of 400 points.

Final grades will be assigned according to the following schedule:

A 380 to 400

A- 360 to 379

B+ 348 to 359

B 336 to 347

B- 320 to 335

C+ 308 to 319

C 296 to 307

C- 280 to 295

D+ 268 to 279

D 240 to 267

F <240

Honor Code & Other Policies

Instructor communication

For specific, concrete questions, e-mail is the most reliable means of contact for me. During the week (Monday 9 a.m. – Friday 5 p.m.) You should receive a response within 24 hours. Weekends or holidays might take 2 or 3 days. If you do not receive a response by Monday at noon, please follow up. Please keep this in mind when you are scheduling your own activities, especially those related to exam preparation. If you wait until the day before an exam is due to ask me a clarification question, there is a good chance that you will not receive a response before the exam.

It is always helpful if your e-mail includes a targeted subject line that begins with "**INLS 201**." Please use complete sentences and professional language in your e-mail.

For more complicated questions or help, come to office hours (right after class) (no appointment necessary!) or make an appointment to talk with me at a different time via WhenWorks (https://when.works/meganwinget). I cannot discuss grades over e-mail; if you have a question about grading, you must talk with me in person.

You are welcome to call me by my first name ("Megan"). However, you may also use "Dr. Winget" if that is more comfortable for you. Either is fine.

Academic integrity

The UNC Honor Code states that:

It shall be the responsibility of every student enrolled at the University of North Carolina to support the principles of academic integrity and to refrain from all forms of academic dishonesty…

This includes prohibitions against the following:

- Falsification, fabrication, or misrepresentation of data or citations.
- Unauthorized assistance or collaboration.

All scholarship builds on previous work, and all scholarship is a form of collaboration, even when working independently. Incorporating the work of others, and collaborating with colleagues, is welcomed in academic work. However, the honor code clarifies that you must always acknowledge when you make use of the ideas, words, or assistance of others in your work. This is typically accomplished through practices of reference, quotation, and citation.

If you are not certain what constitutes proper procedures for acknowledging the work of others, please ask the instructor for assistance. It is your responsibility to ensure that the honor code is appropriately followed. (The UNC Office of Student Conduct provides a variety of honor code resources.)

The UNC Libraries has online tutorials on citation practices and plagiarism that you might find helpful.

Students with disabilities

Students with disabilities should request accommodations from the UNC office of Accessibility Resources and Service (https://accessibility.unc.edu/).

Online Class Statement

1. By enrolling as a student in this course, you agree to abide by the University of North Carolina at Chapel Hill policies related to the Acceptable Use of online resources. Please consult the Acceptable Use Policy on topics such as copyright, net etiquette and privacy protection.
2. As part of this course you may be asked to participate in online discussions or other online activities that may include personal information about you or other students in the course. Please be respectful of the rights and protection of other participants under the UNC-Chapel Hill Information Security Policies when participating in online classes.
3. When using online resources offered by organizations not affiliated with UNC-Chapel Hill such as Google or YouTube, please note that the Terms and Conditions of these companies and not the University's Terms and Conditions apply. These third parties may offer different degrees of privacy protection and access rights to online content. You should be well aware of this when posting content to sites not managed by UNC-Chapel Hill.
4. When links to sites outside of the unc.edu domain are inserted in class discussions, please be mindful that clicking on sites not affiliated with UNC-Chapel Hill may pose a risk for your computer due to the possible presence of malware on such sites.

Schedule

Unit 1: Meaning, Representation, Categorization

Week 1

- Wednesday, January 9: Read course syllabus

Week 2

- Monday, January 14 – Information as facts
    - Luciano Floridi. 2010. Information: a very short introduction. London: Oxford University Press. (Chapters 2-4, p. 19-59.) (Floridi 2010)
- Wednesday, January 16 – Information as "literatures"
    - Phil Agre. 1995. Institional circuitry: thinking about the forms and uses of information. Information Technology and Libraries 14(4): 225-230. (Agre 1995)

Week 3:

- Monday, January 21 – Information as uncertainty
    - James Gleick. 2011. The Information. New York: Pantheon Books. (Chapter 7, p. 204–232.) (Gleick 2011)

- Wednesday, January 23 – Image information as signs (semiotics)
    - John Fiske. 1990. Introduction to Communication Studies, 2nd ed. London and New York: Routledge. (Excerpts: pages 6–12, 39–46, 56–58, 64–65.) (Fiske 1990)

Week 4

- Monday, January 28 – Image information as signs (semiotics of images)
    - Scott McCloud. 1994. Understanding Comics. 1st HarperPerennial ed. New York: HarperPerennial. (Chapter 2, p. 24–59.) (McCloud 1994)
    - Amanda Hess and Quatrung Bui. 2017. What love and sadness look like in 5 countries, according to their top GIFs. New York Times December 29, 2017. Available at: https://nyti.ms/2EdPHSb
- Wednesday January 30 – Distinguishing between things
    - Patrick Wilson. 1968. Two kinds of power: an essay on bibliographical control. Berkeley, CA: University of California Press. Chapter 1 (p. 6-19). (Wilson, 1968 (ch 1))
    - Henry Thompson. 2010. What is a URI and why does it matter? Available at: http://www.ltg.ed.ac.uk/~ht/WhatAreURIs/

Week 5

- Monday February 4 – Distinguishing between types of things (categorizing) (Hand Out Midterm #1)
    - Eviatar Zerubavel. 1991. The fine line: making distinctions in everyday life. Chicago: University of Chicago Press. Chapters 1-2, 1-32. (Zerubavel-1991)
    - Yaa Gyasi. 2016. I'm Ghanian-American. Am I black? New York Times June 18, 2016. (Gyasi 2016)
    - Moises Velasquez-Manoff. 2017. What doctors should ignore. New York Times December 8, 2017. (Velasquez-Manoff 2017)
- Wednesday, February 6 – Naming things
    - Camilla Domonoske. 2017. How two women fought to be called "Miss" and "Ms." NPR, All Things Considered, November 30, 2017. (Listen to the 8-minute sound recording or read the transcript.) Available at: https://www.npr.org/2017/11/30/567572923/how-two-women-fought-to-be-called-miss-and-ms
    - Daniel Duane. 2017. Goodbye, Yosemite. Hello, what? New York Times September 2, 2017. Available at: https://nyti.ms/2xGrpwO
    - Jason Horowitz. 2017. In Myanmar, Pope Francis calls for peace without saying "Rohingya." New York Times Novemer 29, 2017. Available at: https://nyti.ms/2icUbCD
    - Mary Hui. 2017. Flight 666 to HEL takes off for one last time. Washington Post October 13, 2017. Available at: https://www.washingtonpost.com/news/acts-of-faith/wp/2017/10/13/flight-666-to-hel-took-off-one-last-time-this-friday-the-13th

Unit 2: Modelling

Week 6

- Monday, February 11 – Information Organization
    - Lorraine Daston. 2015. Cloud physiognomy: describing the indescribable. Representations 135, Summer 2015, 45-71.(Daston 2015)

    - Eli Rosenberg. 2016. The mountain that tops Everest (because the world is fat). New York Times, May 16, 2016. (Rosenberg 2016)
- Wednesday, February 13 – Categorizing things systematically (Midterm #1 DUE at the beginning of class)
    - Eric J. Hunter. 2002. Classification made simple. 2nd ed. Aldershot, England: Ashgate. (Chapters 1-5.) (Hunter 2002)
    - John Dupre. 2006. Scientific classification. Theory, Culture, and Society 23(2-3): 30-32. (Dupre 2006)

Week 7

- Monday, February 18: Computation & Boolean Algebra
    - W. Hillis. 1998. The Pattern on the Stone. New York: Basic Books. (Chapter 1, p. 1–38.) (Hillis 1998)
    - Edmund C. Berkeley. 1937. Boolean algebra (the technique for manipulating AND, OR, NOT and conditions). The Record 26 part II (54): 373–414. (Berkeley 1937)
- Wednesday, February 20: Modeling information about things as sets: relational databases
    - Peter Pin-Shan Chen. 1976. The entity-relationship model—toward a unified view of data. ACM Transactions on Database Systems 1(1): (9–36. (Chen 1976)

Week 8

- Monday, February 25 – Modeling information about things as graphs: networks
    - David Easley and Jon Kleinberg. 2010. Networks, crowds, and markets: reasoning about a highly connected world. New York: Cambridge University Press. Chapter 1 (p. 1-20). (Easley and Kleinberg 2010 Chapter 1)
- Wednesday, February 27 – Computationally created models: Boolean retrieval (and modeling texts for computation)
    - Christopher Manning, Prabhakar Raghvan, and Hinrich Schütze. 2009. Introduction to Information Retrieval, New York: Cambridge University Press. (Chapters 1 and 2, 1–34.) (Manning Rhagvan and Schutze 2009, chapter 1)(Manning Rhagvan and Schutze 2009 chapter 2)

Week 9

- Monday, March 4 – Assessing the results of computation: correctness
  - Brian Cantwell Smith. 1985. The limits of correctness. In Symposium on Unintentional Nuclear War, Fifth Congress of the International Physicians for the Prevention of Nuclear War. Budapest, 1985. (Cantwell Smith 1985)
- Wednesday, March 6 – Statistical models
  - Cathy O'Neil. 2016. Weapons of Math Destruction. New York: Crown, 2016. (Chapter 1, 15–31.) (ONeil 2016)

Spring Break!

Week 10

- Monday, March 18 – Probability
  (Hand Out Midterm #2)
  - Ian Hacking. 2001. An Introduction to Probability and Inductive Logic. Cambridge: Cambridge University Press. (Chapters 2-7, p. 11-77.) (Hacking 2001)
- Wednesday, March 20 – Computationally created models: Probabilistic retrieval and ranked lists
  - M.E. Maron. 1961. Automatic indexing: an experimental inquiry. Journal of the ACM 8(3): 404–17. (Maron 1961)

Week 11

- Monday, March 25 – Assessing the results of ranked lists: relevance
  - Michael Buckland. 2017. Information and society. Cambridge, MA: MIT Press. (Chapter 8.) (Buckland 2017 Chapter 8)
  - Patrick Wilson. 1968. Two kinds of power: an essay on bibliographical control. Berkeley, CA: University of California Press. Chapter 4 (p. 41-54). (Wilson 1968 Chapter 4)
- Wednesday, March 27 – Assessing the results of ranked lists: information credibility
  (Turn in Midterm #2 Beginning of Class)
  - Soo Young Rieh. 2010. Credibility and cognitive authority of information. In Encyclopedia of Library and Information Sciences, Marcia Bates, ed. New York: CRC Press, 1337-1344. (Rieh 2010)
  - Kate Starbird. 2017. Information wars: a window onto the alternative media ecosystem. Medium March 14, 2017. Available at: https://medium.com/hci-design-at-uw/information-wars-a-window-into-the-alternative-media-ecosystem-a1347f32fd8f

Unit 3: The Effects of Computational Modeling

Week 13

- Monday, April 1 – Pervasive sorting and ranking – social effects
  - Safiya Noble. 2013. Google search: hyper-visibility as a means of rendering black women and girls invisible. InVisible Culture: an Electronic Journal for Visual Culture 19. Available at: http://ivc.lib.rochester.edu/google-search-hyper-visibility-as-a-means-of-rendering-black-women-and-girls-invisible/
  - Julia Angwin, Jeff Larson, Surya Mattu, and Lauren Kirchener. 2016. Machine bias. ProPublica, May 23, 2016. Available at: https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing
- Wednesday, April 3: In-Class Activities

Week 14

- Monday, April 8 – Pervasive sorting and ranking: economic effects
  - David Segal. 2011. The dirty little secrets of search. New York Times, February 12, 2011. Available at: http://www.nytimes.com/2011/02/13/business/13search.html
  - Adam Duhigg. 2012. How companies learn your secrets. New York Times, February 16, 2012. Available at: http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html
  - Jerry Useem. 2017. How online shopping makes suckers of us all. The Atlantic May 2017. Available at: https://www.theatlantic.com/magazine/archive/2017/05/how-online-shopping-makes-suckers-of-us-all/521448/
- Wednesday, April 10: In-Class Activities

Week 15

- Monday, April 15 – Scrutinizing Recommendation Systems
  - Matthew J. Salganik, and Duncan J. Watts. "Leading the Herd Astray: An Experimental Study of Self-Fulfilling Prophecies in an Artificial Cultural Market." *Social Psychology Quarterly* 71, no. 4 (December 1, 2008): 338–55. https://doi.org/10.1177/019027250807100404.
- Wednesday, April 17 – In-Class Activities
  Hand out Final Exam

Week 16

- Monday, April 22 – Scrutinizing Large-Scale Recommendation Systems
  - Bridle, James. "Something Is Wrong on the Internet." James Bridle, November 6, 2017. https://medium.com/@jamesbridle/something-is-wrong-on-the-internet-c39c471271d2.
- Wednesday, April 24: In-class Activities

Final Exam DUE Monday April 29 at 8am via Sakai.

Acknowledgements and thanks

This syllabus includes elements of INLS 201 sections taught by Diane Kelly, Ron Bergquist, Melanie Feinberg and Ryan Shaw.