

# School of Information 500

## Information in social systems: Collections, flows and processing

### The SI Perspective

Syllabus — Fall 2009

#### Course Overview

Successful leaders are strategic problem solvers. They **choose** among competing alternatives, **learn** more effective skills and strategies, and **coordinate** the activity of diverse individuals. Information is central to choosing, learning and coordinating. Successful **information** leaders are those who will solve problems we can't even define today. To prepare to solve unknown problems, you must learn enduring fundamentals about people, information and technology, and most importantly how they interact.

This course provides School of Information Masters' students with concepts that are essential for further coursework at SI and for their professional careers. It presents a distinctive synthesis of important ideas about the use and value of information from psychology, information and library science, economics, archival science, computer science, sociology, law, and history. It distills concepts essential to the School of Information's unique perspective on information studies (hence its informal title, "The SI Perspective.") The lectures, case studies, discussion topics, writing assignments, and exams in this course are designed to deepen and broaden the way SI students approach their professional work.

The course therefore aims at more than conveying concepts. It also presents a larger framework that links those concepts and provides repeated opportunities to relate course concepts to the kinds of issues that arise in the information world. It is a synthesis of many theories, aimed at the requirements of practice.

The course serves a number of important functions. It helps prepare students to analyze problems of information requirements, practices or policies. It provides essential background that can be drawn upon by instructors in all other SI courses. It creates a common body of knowledge shared by all students, to facilitate student collaborations and informal learning. Finally, it is designed to open new doors — to introduce ideas, theories, disciplines, and relationships among them — in order to enhance all students' path through the School of Information education and their subsequent choices of life goals and careers.

#### Learning Objectives

The School of Information seeks "To Bring People, Information and Technology Together in more Valuable Ways." Students in the SI masters program should be able to analyze, design and manage information collections, flows and processing from the perspective captured in SI's mission.

The SI faculty has developed a lengthy statement of specific learning objectives for SI 500 that follow from this basic commitment. It lays out the things that students completing the course should know, and be able to do. They are listed in detail in a separate document, available in the

Resources section on the CTools site. The document also provides a “cross-index” to the course schedule, indicating the weeks during the term that particular topics receive significant attention.

Students can gain a much better understanding of the topics being covered in the course, and of how the topics relate to each other, by referring to the learning objectives document.

### **Course Structure**

SI 500 is required for completion of the Masters’ degree. To reduce class size and provide more flexible scheduling, one weekly lecture is delivered three times. Each lecture is paired with four discussion sections. Students enroll in one of the discussion sections and attend the lecture that is paired with that discussion. A Graduate Student Instructor (GSI) will lead the 90 minute discussion section.

**About discussion sections:** Discussion sections are scheduled to meet *prior to the lecture*. The sections provide an opportunity to clarify the week's focal concepts, apply ideas from the readings to examples, and confront alternate interpretations. In order to maintain a cohesive group over the term, we require that each student attend only his or her own discussion section; moving around between sections is not permitted.

**The lectures:** The lecture following each section will stress important ideas, provide illustrative extended examples, and relate the week's material to larger course themes. **Lectures will not rehearse readings in detail.** For this structure to be effective, it is therefore essential that students complete readings and other preparation **before** the discussion sections. This process not only increases what an individual will learn, but helps all members of a discussion section learn from the views and questions of the others. Accordingly, attendance at section meetings is required, and *participation in sections is the single largest component of the course grade (25%).*

### **Course Requirements and Student Evaluation**

Students will be asked to participate actively in all discussion sections and attend all lectures. Assignments include one ungraded and four graded assignments during the term, followed by a take-home final examination. All assignments must be submitted *both* in hard copy at the student's lecture *and* electronically via the UM CTools system. Deadline for posting the CTools copy is the beginning of the student's lecture, or the time specified in the syllabus.

**Grading.** In accordance with School of Information policy for the Foundations courses, SI 500 will be graded "on a curve." The median grade will be a B+. (In other words, half of all students in the course will receive a B+ or higher, while the other half will receive a B+ or lower.)

<b>Assignment</b>	<b>Due Date/Time</b>	<b>Percentage of Grade</b>
Do we still need libraries?	September 16/17 <sup>th</sup> ; in lecture	Feedback only
Final Paper Problem	September 30 <sup>th</sup> ; 8 a.m.	
Assignment 1	October 7 <sup>th</sup> ; 8 a.m.	15%
Interim Report on Final Paper	October 28 <sup>th</sup> ; 8 a.m.	
Assignment 2	November 4; 8 a.m.	20%
Newspapers in Crisis	November 18/19 <sup>th</sup> ; in lecture	10%
Final Paper	December 11 <sup>th</sup> ; 8 a.m.	30%
Participation	Ongoing	25%

**Grade reconsideration:** We make every effort to apply grading criteria objectively and fairly. However, if you believe the grade you received on an assignment is inappropriate, you may apply to have your grade reconsidered. This means that we will re-grade your work "from scratch," on the original criteria. Submitting a grade reconsideration form does not ensure that your grade will change, but your arguments will be carefully considered. (Also note that reconsideration may result in either a higher *or a lower* grade.) To apply, email a completed "Grade Reconsideration Form" (available on CTools, in the Assignments folder under Resources) to [SI500-F09-GSI@umich.edu](mailto:SI500-F09-GSI@umich.edu) within two weeks after the assignment was returned. The instructors will respond within two weeks of your request.

### **Course Resources**

There is no "course pack" or required textbook for the course. All course materials are provided in electronic form under the "fair use" copyright exemption. This means that you **may not** redistribute copies of class readings outside the class. For more information see "[Copyright at the University of Michigan: For Students.](#)"

Course readings and other resources are delivered via the University of Michigan [CTools](#) course management system. Inside the *Resources* folder in CTools are copies of the weekly course readings, assignments, lecture slides, and other items, along with tools for submitting assignments, a discussion board, a course email archive, and other facilities. The most current copy of this document, the Course Syllabus, also resides in the *Resources* folder.

All readings are in folders labeled by week number (keyed to the syllabus). *Required* readings are central for the course. We expect you to read them carefully and fully prior to each week's discussion section and lecture. *Recommended* readings provide more depth on a topic, or an example of the key concepts discussed in the required readings. We may add items to the recommended readings throughout the term, but we will not change the required readings after the course begins.

CTools maintains an archive of all email messages sent to the entire class. Each discussion section will also have its own, separate email list. Each GSI will announce his or her own policies for using section email lists.

### **Original Work**

**Collaboration.** We strongly encourage collaboration while working on homework problems, and while discussing and interpreting the reading assignments. Active learning is effective. Collaboration will be especially valuable in summarizing the reading materials and picking out the key concepts. *You must, however, write your homework submission on your own, in your own words, before turning it in. If you worked with someone on the homework before writing it, you must list any and all collaborators on your written submission.*

**Plagiarism.** All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work.

You may incorporate selected excerpts from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own, or be explicitly attributed to another. See the Rackham Graduate policy on Academic and Professional Integrity <http://www.rackham.umich.edu/policies/gsh/appb/> for the definition of plagiarism, and associated consequences.

### **Accommodations for students with disabilities**

The University Faculty Senate (SACUA) in 2006 endorsed the following language for inclusion on course syllabi: If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; <http://www.umich.edu/~sswd/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

### **Instructors**

<b><i>Instructor</i></b>	<b><i>Role</i></b>	<b><i>Office Hours</i></b>	<b><i>Location</i></b>	<b><i>Email</i></b>
Michael Cohen	Professor	Friday: 10:30-11:30 a.m.	312 WH	<a href="mailto:mdc@umich.edu">mdc@umich.edu</a>
Paul Edwards	Professor	Thursday: 9:00-10:00 a.m.	3078 WH	<a href="mailto:pne@umich.edu">pne@umich.edu</a>
Elizabeth Yakel	Professor	Monday: 12:00-2:00 p.m.	301C WH	<a href="mailto:yakel@umich.edu">yakel@umich.edu</a>
Ayse Buyuktur	GSI	Thursday: 10:30-11:30 a.m.	Shapiro B138 (basement)	<a href="mailto:abuyuktu@umich.edu">abuyuktu@umich.edu</a>
Shu-Yi (Max) Chen	GSI	Thursday: 3:00-4:00 p.m.	Shapiro B138 (basement)	<a href="mailto:maxchen@umich.edu">maxchen@umich.edu</a>
Radaphat (Pae) Chongthammakun	GSI	Tuesday: 12:00-1:00 p.m.	Shapiro B138 (basement)	<a href="mailto:radaphat@umich.edu">radaphat@umich.edu</a>
Paul Hartzog	GSI	Wednesday: 10:00-11:00 a.m. Thursday: 1:30-2:30 p.m.	Shapiro B138 (basement)	<a href="mailto:phartzog@umich.edu">phartzog@umich.edu</a>
Ji Yeon Yang	GSI	Thursday: 5:00-6:00 p.m.	Shapiro B138 (basement)	<a href="mailto:jiyeon@umich.edu">jiyeon@umich.edu</a>
Xiaomu Zhou	GSI	Tuesday: 6:00-7:00 p.m.	Shapiro B138 (basement)	<a href="mailto:xmzhou@umich.edu">xmzhou@umich.edu</a>

In addition to the regularly scheduled office hours, all instructors as available 'by appointment'. Just email the instructor to arrange a meeting if you cannot meet during office hours.

## **Course Schedule**

### **Week 1 (Sept. 9/10): Introduction**

An overview of the course. What is information? What are collections, flows, and processing? How does the long history of information technology influence our present, and affect our future?

**No reading for this session**

### **Week 2 (Sept. 16/17): Do we still need libraries?**

What is a library? What sorts of collections do libraries contain? What sorts of services to libraries offer? How do materials flow through them, and what sorts of processing do they do? How are people, information, and technology involved, separately and together? Do we still need libraries in the age of the World Wide Web?

This week's assignment involves a group project leading to a presentation in the subsequent lecture session. GSIs will explain the project in section meetings. To complete the assignment, you will need to meet once (outside of section) with the other students in your group.

#### **Required:**

David Weinberger (2007). *Everything Is Miscellaneous: The Power of the New Digital Disorder* (New York: Times Books), Ch. 1: "The New Order of Order" and Ch. 5: "The Laws of the Jungle", pp 8-23, 84-106

Christine Borgman (2007). *Scholarship in the Digital Age: Information, Infrastructure, and the Internet*, Cambridge: MIT Press. (Chapter 1: "Scholarship at a Crossroads" and 2: "Building the Scholarly Infrastructure")

Katherine Bertolucci (2009). "Beyond Findability: Organizing in the Age of the Miscellaneous," *Searcher* (February): 32-40

Brewster Kahle, Video (2008). "Library 2.0," John Seely Brown Symposium on Technology & Society, School of Information, University of Michigan, 2008. Please watch the first segment, available at <http://www.si.umich.edu/jsb/2008.htm>

#### **Recommended:**

Blog entry: <http://acrlog.org/2008/08/19/library-as-place-for-air-conditioning-books/> . The original video is located at: <http://hosted-video.mediasite.com/hosted/Sc.aspx?T=S&N=1> .

## **PART I: Individual Information Use**

### **Week 3 (Sept. 23/24): Human Information Capabilities**

Perception (combining processing and flow). Memory (collection and processing). Communication (processing and flow). Cognition, emotion and habit as three broad categories of human information processing.

**Required:**

- John R. Anderson (2004). *Cognitive Psychology and Its Implications*, 6th ed., Ch. 2: "Perception," pp. 36-71
- Steve Silberman (2004). "Talking to Strangers," *Wired* 8.05
- Daniel L. Schacter (1996). *Searching for Memory: The brain, the mind, and the past*. New York: Basic: Ch 2: 39 – 71
- Jose van Dijck (2007). *Mediated Memories in the Digital Age*, Ch. 1, "Mediated Memories as a Conceptual Tool"; Ch. 2, "Memory Matters in the Digital Age"; and Ch. 5, "Pictures of Life, Living Pictures"
- Oliver Sacks (1985). *The Man who Mistook his Wife for a Hat*, Ch. 1, "The Man who Mistook his Wife for a Hat," pp. 7-21

**Week 4 (Sept. 30/Oct. 1): Human Information Capabilities in Action, I**

More detailed exploration of learning, problem solving, and choice. Short term memory effects in problem solving. Transition from novice to expert. Heuristic search. Category formation. Uncertainty in decision making. Utility as a model of value in problem solving.

**Required:**

- Robert H. Frank (2007). *Microeconomics and Behavior* Ch. 1: "Thinking Like an Economist," pp. 3-26
- Warren Weaver (1949). "Recent Contributions to the Mathematical Theory of Communication," in C. Shannon and W. Weaver, *The Mathematical Theory of Communication* (Urbana, IL: University of Illinois Press), pp. 1-16
- How People Learn: Brain, Mind, Experience, and School*. (1999). John D. Bransford, Ann L. Brown, and Rodney R. Cocking, eds. Ch 1: "Learning from Speculation to Science," Ch. 2: "How Experts differ from Novices," and Ch. 3: "Learning and Transfer."

**Recommended:**

- David Ritchie (1986). "Shannon and Weaver: Unraveling the Paradox of Information," *Communication Research*, 13:278-298
- Claude E. Shannon (1948). "A mathematical theory of communication," *Bell System Technical Journal*, vol. 27, pp. 379-423 and 623-656, July and October

**Week 5 (Oct. 7/8): Collective Mechanisms of Memory**

Collective mechanisms of memory. Collections such as personal records, archives, libraries, museums, databases and digital repositories. Processing, such as systems of information organization and retrieval. (metadata, full-text searching, finding aids), standards.

**Required:**

- Kenneth E. Foote (1990). "To remember and forget: Archives, memory, and culture." *American Archivist* 53/3 (Summer): pp. 378-392
- Peter Morville (2005). *Ambient Findability*. O'Reilly Media. (Chapters 1: "Lost and Found" pp. 1-15 and 6: "Sociosemantic Web" pp. 119-154)
- John Seeley Brown and Paul Duguid (1996). "The Social Life of Documents" *First Monday*, 1/1 May 6th

Alex Wright (2008). "The Web Time Forgot," *New York Times*, June 17

**Recommended:**

W.B. Rayward (1994). "Visions of Xanadu: Paul Otlet (1866-1944) and Hypertext." *Journal of the American Society for Information Science* 45.4 (1994): 235-50

**Week 6 (Oct. 14/15):** Human Information Capabilities in Action, II

Design: aesthetics, emotion, and habit. More detailed exploration of habit and emotion, including affordances, inarticulate capabilities, habit and emotion in the formation of values, aesthetics and usability, and stress-related resistance to change.

**Required:**

William Lidwell, Kritina Holden, Jill Butler (2003). *Universal Principles of Design* (Rockport Publishers, 2003), pp. 20-21 (Affordance), 24-25 (Archetypes), 30-31 (Chunking), 36-37 (Cognitive Dissonance), 50-51 (Constraint), 56-57 (Cost-Benefit), 60-61 (Depth of Processing), 104-105 (Hierarchy), 114-115 (Interference Effects), 148-149 (Performance Load), 166-167 (Redundancy), 182-183 (Signal-to-Noise Ratio), 208-209 (Wayfinding)

Donald Norman (2005). *Emotional Design*, Ch. 1. "Attractive Things Work Better," pp. 17-34

Edward R. Tufte (1983). *Visual Display of Quantitative Information*, Ch. 1, "Graphical Excellence," pp. 13-52

David T. Neal, Wendy Wood, and Jeffrey M. Quinn (2006). "Habits—A Repeat Performance," *Current Direction in Psychological Science* 15/4: 198-202

**Recommended:**

Natalie Sebanz (2006). "It takes 2 to..." *Scientific American Mind* December 2006/January 2007): pp. 52-57.

**FALL BREAK - Oct. 19/20 – Details of section meetings for this week to be announced.**

**Part II. Social Information Use**

**Week 7 (Oct. 21/22):** Information Processing in Social Action, I

Common ground in communication. Information for coordination (benefits of concerted action, expected utility of uncertain situations, value of information, the nature of insurance).

**Required:**

Herbert A. Simon (1996), *The Sciences of the Artificial*, Third Edition (Cambridge, MA: MIT Press): Chapter 8: "The Architecture of Complexity: Hierarchic Systems," 183-216

Herbert H. Clark and Brennan, S.E. (1991), "Grounding in communication." In L. Resnick, J. Levine, & S. Teasley (Eds.) *Perspectives on socially shared cognition*. Washington, D.C.: American Psychological Association, pp. 127-149

Christian Heath and Paul Luff (1991), "Collaborative activity and technological design: Task coordination in London Underground control rooms." *ECSCW '91. Proceedings of the Second European Conference on Computer Supported Cooperative Work*, eds. L. Bannon, M. Robinson and K. Schmidt, Kluwer Academic Publishers, pp. 65-80

Robert H. Frank (2007), *Microeconomics and Behavior*, Ch. 6: "The Economics of Information and Choice under Uncertainty," Part 2: pp 179-193

### **Recommended:**

P. Kollock (1998), "Social dilemmas: The anatomy of cooperation," *Annual Review of Sociology* 24: 183-214

### **Week 8 (Oct. 28/29):** Information Processing in Social Action, II

Sense-making in social systems as cognition, habit and emotion. Information in collective decision making (rumors, wisdom of crowds/information pooling/costs & benefits of diversity). Breakdown and repair in perception and routine.

Linda Argote, L. (1999) *Organizational Learning: Creating, Retaining, and Transferring Knowledge*, Kluwer Academic Publishers. Ch. 3: "Organizational Memory," 67-97

Yochai Benkler, "Coase's Penguin, Or, Linux and 'the Nature of the Firm'." *Yale Law Journal* 112.3 (2002): 369-446

R. R. Nelson, and S. G. Winter (1982) *An Evolutionary Theory of Economic Change*, Harvard University Press. Ch. 4: "Skills," 72-136

### **Week 9 (Nov. 4/5):** Regulation of information flow in social systems

Access control and secrecy, privacy, censorship, intellectual property, information overload, social systems of filtration and attention direction (advertising, social authority, publisher reputation), digital rights management.

Farhad Manjoo (2004), "Too Much of a Good Thing," Salon.com

Margaret Hedstrom (2002), "The Archivist's Creed: No Politics, No Religion, No Morals," South African Society of Archivists Newsletter (July/September): p. 1-2, 5

Mike Featherstone (2000), "Archiving cultures," *British Journal of Sociology* 51/1 (January/March): 161-184

David Wallace (2005), "Freedom of Information in the Digital Age: A Crisis of Diminished Accountability and Access," in *The Power and Passion of Archives: A Festschrift in Honour of Kent Haworth*, Association of Canadian Archivists, Saskatoon, Saskatchewan: pp. 69-84

Codes of Ethics: Society of American Archivists, American Library Association, Special Libraries Association, Medical Libraries Association, Institute of management Consultants, Association for Computing Machinery,



### Part III: Technologies of Information

**Week 10 (Nov. 11/12):** The changing cost and structure of collecting, storing and processing information

Language, writing and printing as illustrations of the mutual determination of technological and social forces. (The different uses of printing in the Asian, Islamic and European worlds.) Broadcast media as instruments of nationalism. Ever-declining costs of digital storage, processing and transmission. Technical and social sources. Social and economic consequences (new business models, new flows of information (email, blogosphere, ubicomp).

Edward Tenner (1997). "Ever since Frankenstein" in *Why Things Bite Back: Technology and the Revenge of Unintended Consequences*. Vintage: New York. pp. 3-32

Greg Downey (2001). "Virtual Webs, Physical Technologies, and Hidden Workers: The Spaces of Labor in Information Internetworks." *Technology and Culture* 42: 209-35

Walter Ong (1982). *Orality and Literacy: The Technologizing of the Word*, Ch. 4: "Writing Restructures Consciousness," pp. 77-114

#### Recommended:

Paul N. Edwards, Steven J. Jackson, Geoffrey C. Bowker, and Cory P. Knobel, *Understanding Infrastructure: Dynamics, Tensions, and Design*. Report of the NSF Workshop on History & Theory of Infrastructure: Lessons for New Scientific Cyberinfrastructures (Ann Arbor: Deep Blue, 2007)

**Week 11 (Nov. 18/19):** Case week – Newspapers in Crisis

**Thanksgiving Break: Nov. 25/26, no lectures or sections**

**Week 12 (Dec. 2/3):** Distance collaboration and Web 2.0

Tagging. Social networking (collections of people; collections and people, flows.) Distributed work. Authority.

#### Required:

Pam J. Hinds and D.E. Bailey. "Out of Sight, Out of Sync: Understanding Conflict in Distributed Teams." *Organization Science* (2003): 615-632.

Aniket Kittur, Ed Chi, Bryan Pendleton, et al. (2007). "Power of the Few vs. Wisdom of the Crowd: Wikipedia and the Rise of the Bourgeoisie." *World Wide Web* 1/2.

Jennifer Trant and Bruce Wyman, "Investigating social tagging and folksonomy in art museums with steve.museum," <http://www.archimuse.com/research/www2006-tagging-steve.pdf>

Howard Rheingold (2002), "Mobile virtual communities," *Receiver* 6.

Howard Rheingold (2002). "Always-on Panopticon... or Cooperation Amplifier?" Ch. 8: *Smart Mobs: The Next Social Revolution*: pp. 183-215

**Recommended:**

Aniket Kittur, and Robert E. Kraut. "Harnessing the Wisdom of Crowds in Wikipedia: Quality Through Coordination." *Proceedings of the ACM 2008 conference on Computer supported cooperative work*. ACM New York, NY, USA, 2008. 37-46.

Don R. Swanson (1986). "Undiscovered Public Knowledge," *The Library Quarterly*, 56/2 (April): 103-118

**Week 13: Dec. 9/10:** Conclusion: a concept map of SI 500