Human Factors in Information System Design

ISMT E-170 (Course #24279)
Harvard Extension School
Spring 2015 Course Syllabus
Online Monday Evenings 7:40 PM to 9:40 PM

Instructor Team:

Professor Dennis Galletta Director, Doctoral Program Katz Graduate School of Business University of Pittsburgh Email: galletta@katz.pitt.edu	Teaching Fellow: Jeremy Doran

While many organizations have outsourced the design of production systems, the recent Internet and e-commerce explosion has created an even wider need to design corporate web sites. These sites are developed by people of various backgrounds, but organizational practices must exist to make sure they take into account what we know about human factors engineering. This course focuses on how to gather requirements, achieve a usable first draft, and test and improve that draft. A half-dozen course projects will include usability critiques and designs. As the course progresses, your critique will become a fact-finding mission, then a design project, then a set of prototype screens or storyboard.

The course is intended for anyone with special interest in usability, and will be especially useful for those who will manage projects, write code, or provide input to system or web development projects.

Rationale and Learning Objectives:

Many of us know good and bad designs when we see them. However, creating those designs is another issue altogether. It is fascinating to observe how a well-designed system seems to be just plain obvious and intuitive. Although some people seem to have a knack for good design approaches, the designs almost never just emerge as easily as they appear. Rather than being divinely inspired, one must count not only on creative skills but also on the use of starting principles that have emerged over time, modeling the designs, and thoroughly testing those designs. As systems become more complex, much more preparation is needed. In theory, a large investment in design will result in lower training costs as well as higher efficiency and effectiveness in system use.

The course will provide a well-rounded view of Information Systems design in an organizational context, enabling you to:

- Find useful starting principles for designing systems, including websites and corporate systems.

- Model the new or improved system (web site, icon, production system)
- Scrutinize the design through analysis of use cases and testing with real users

ISMT S-170 works as a stand-alone course or it can directly augment a course on Analysis and Design of Information Systems. It can indirectly augment a course on Database Management and any course on programming by providing a context on which you can aim those technical weapons you've developed.

Texts:

- Te'eni, Carey, and Zhang: *Human-Computer Interaction: Developing Effective Organizational Information Systems,* 2007, Wiley, ISBN 978-0471677659
- Norman, Donald A. *The Design of Everyday Things, Revised and Expanded Edition* New York: Basic Books (368 pgs) 2013, ISBN-13: 978-0465050659
- Koyani, Sanjay J., Bailey, Robert W., and Nall, Janice R. *Research-Based Web Design & Usability Guidelines,* available free in book form or at http://www.usability.gov/guidelines/

Other readings: A few additional readings will be assigned for each class. Many will report studies from our labs. Some might be replaced if any newer papers are finished during the course. These are listed in the order in which they are covered, and numbered for ease of reference in the schedule.

1. Galletta, D.F. (2006) "Human Factors and E-Commerce," chapter in *Electronic Commerce and the Digital Economy,* M.E. Sharpe, 91-111.
2. Galletta, D.F., Durcikova, A., Everard, A., and Jones, B. (2005) "Does Spell-Checking Software Need a Warning Label?" *Communications of the ACM,* Volume 48, Number 7, pp. 82-85.
3. Norman D. and Nielsen J., Gestural Interfaces: A Step Backward In Usability, *Interactions,* 2010
4. Nielsen Norman (2010/2011) Reports of iPad usability http://www.nngroup.com/reports/ipad-app-and-website-usability/
5. Galletta, D. F. and B.K. Dunn "Assessing Smartphone Ease of Use and Learning from the Perspective of Novice and Expert Users: Development and Illustration of Mobile Benchmark Tasks, *AIS Transactions on Human-Computer Interaction,*" Vol. 6, Number 4, December, 2014.
6. Bewley, W.L., T.L. Roberts, D. Schroit, & W.L. Verplank, (1983). "Human Factors Testing in the Design of Xerox's 8010 'Star' Office Workstation," Human Factors in Computing Systems - *CHI '83 Proceedings,* December, 72-77.
7. Carroll, John M., "The Adventure of Getting to Know a Computer," *IEEE Computer,* 15(11):49-58, 1987.
8. Gould, J.D. & Lewis, C. (1985). "Designing for Usability: Key Principles and What Designers Think," *Communications of the ACM,* March, 28(3), 300-311. Available here. (This is a classic in the field).
9. Everard, A. and Galletta, D.F. (2005-2006) "How Presentation Flaws Affect Perceived Site Quality, Trust, and Intentions to Purchase from an On-Line Store," *Journal of MIS,* Volume 22, Number 3, pp. 55-95.
10. Galletta, D.F., Henry, R., McCoy, S., and Polak, P. March, 2006 "When the Wait Isn't So Bad," *Information Systems Research,* Volume 17, No. 1, pp. 20-37.
11. Chung, R. and Galletta, D.F. (2013) "Genetic Basis of Behavioral Security," Proceedings of the Twelfth Annual Workshop on HCI Research in MIS, Milan, Italy, December 15.

12. Boss, S., Galletta, D.F., Lowry, P.B., Moody, G., and Polak, P. "What Do Systems Users Have to Fear? Using Fear Appeals to Engender Threats and Fear that Motivate Protective Security Behaviors in Users," Conditionally Accepted, *MIS Quarterly.*
13. Jagatic, Johnson, Jakobsson, and Menczer, "Social Phishing," *Communications of the ACM,* Vol. 50, October 2007, pp. 94-100.
14. Moody, G., Galletta, D.F., Walker, J., Dunn, B.K. "Which Phish Get Caught? An Exploratory Study of Individual Susceptibility to Phishing," ICIS 2011, Shanghai, December 3-6.
15. Galletta, D.F., Ahuja, M., Hartman, A., Peace, A.G., and Teo, T. (1995) "Social Influence and End-User Training," *Communications of the ACM,* V. 38, N. 7, pp. 70-79.
16. Ronen H. and Te'eni D (2011). Dynamic Personal Feedback in Acquiring Information to Manage Your Health. International Conference on Information Systems 2011, Shanghai, December, 3-6.
17. Shirkey, Clay and Carr, Nicholas: "Does the Internet Make You Smarter or Dumber?" "Weekend Journal" section of the *Wall Street Journal,* June 5-6, 2010, pp. W1-W2.

Grading

Required (all students – individual completion):

Mini-assignments (4 @ 5)	20
Design Project Part 1: Bad Website	10
Design Project Part 2: Proposal	10
Design Project Part 3: Data Collection	15
Design Project Part 4: Design fixes	10
Design Project Wrapup: Final presentation (record 4-minute video and upload)	15
Attendance	5
Participation	5

***C*hoose any <u>one</u> of the following additional assignments:**

Reality Checks	10 or
Book review	10 or
Research project proposal (especially useful for students headed to a PhD program)	<u>10</u>
Total	100

Please refer to the detailed requirements of each assignment on the following pages.

#	Date	Topic and Assignment Due the Night Before Class	Reading Due
1	Jan 26	Introduction	Te'eni Chap 1 Galletta (2006)[1]
2	Feb 2	Organizational and Business Context Interactive Technologies	Te'eni Chap 2 (skim only), Chap 3 Galletta Durcikova Everard Jones (2005)[2]
3	Feb 9	**Back to the Future** Physical Engineering Norman: Psychopathology of Everyday Things	Te'eni Chap 4 Norman Chap 1 Norman/Nielsen[3]
	Feb 16	No class – Presidents Day	
4	Feb 23	**Design Project 1: Bad Site** Norman: Psychology of Everyday Actions	Norman Chap 2 Nielsen/Norman[4] Galletta & Dunn (2014)[5] Bewley et al. (1983)[6]
5	Mar 2	Get ready for the March 8 deadline Cognitive Engineering Norman: Knowledge: Head and What to Do	Te'eni Chap 5 Norman chaps 3-4
6	Mar 9	**Design Project 2: Proposal to Fix the Site** Affective Engineering Norman: Human Error	Te'eni Chap 6 Norman Chap 5 Carroll (1987)[7]
	Mar 16	No class – Spring break	
7	Mar 23	**Text Screen** Evaluation Norman: Design Thinking	Te'eni Chap 7 Norman Chap 6 Gould & Lewis (1985)[8] Everard & Galletta (2005-2006)[9]
8	Mar 30	Don't forget about your April 12 deadline. Design Principles Norman: Design in the World of Business	Te'eni Chap 8 Norman Chap 7 Galletta Henry McCoy Polak (2006)[10]
9	Apr 6	**Icon Design** Tasks in the Organizational Context	Te'eni Chap 9 Koyani online book: skim the table of contents and read any 10 principles at random through the book to get an idea of the content
10	Apr 13	**Design Project 3: Data Collection** Componential Design	Te'eni Chap 10
11	Apr 20	Don't forget about your next three deadlines. Development Methodology Behavioral Security	Te'eni Chap 11 Boss, Galletta, Lowry, Moody, Polak (2016)[11] Chung & Galletta (2013)[12] Jagatic (2007)[13] Moody et al. (2011)[14]
12	Apr 27	**Research** HCI Madness Collaboration	Te'eni Chap 12 Galletta Ahuja et al (1995)[15]
	May 4	**Design Project 4: Design Fixes** Social and Global Issues	Te'eni Chap 13 Ronen & Te'eni (2011)[16] Shirky & Carr (2010)[17]
Final	May 11	**Design Project Presentation**	

Administrative Matters

Harvard has a well-defined process for many administrative matters. There are specific procedures for students with disabilities (please contact Academic Services at 617-495-0977 or disabilities@dcemail.harvard.edu), religious conflicts, and makeups (only by appeal through the University). Also, taking attendance is required of me, especially during the early classes to allow waitlisted students to take the place of non-attending registered students. Given that you are taking the course for graduate credit and have obviously survived an undergraduate program, suffice it to say that your submitted work must be yours and yours alone unless the assignment is clearly labeled to be from your group. As you most likely know by now, there are severe penalties for academic dishonesty, which includes copying nearly any amount of text from a web site without quotation marks or attribution and any amount of copying from others. If you cite a source, simply use quotation marks around the section you are quoting and then insert an author name and year in parentheses, as well as a list of complete references. If you do this, as the only modestly funny joke goes, "cheating" becomes "research." Because you are all held closely to it, you should be familiar with the academic integrity policy explained in http://www.summer.harvard.edu/exams-grades-policies/student-responsibilities.

Student Responsibilities[1]

Classroom conduct: Please turn off cell phones and pagers (or set to "silent"). If you need to leave the classroom for any reason, please do so quietly to minimize disruption to the rest of the class. Also, please hold private conversations outside the classroom. If you know you will need to leave prior to the end of the scheduled time for the class session, please let me know before the class begins.

Your participation is important in the class. I will expect you to:

- Actively participate in classroom discussions, but not to dominate every conversation. I expect you to contribute regularly but also give others a significant chance as well.
- Ask questions to clarify material that is not understood
- Initiate meaningful discussions to extend analysis on topics of interest that are related to class material
- Please do not initiate loosely-related discussions just to be marked as "participating." Other students would like to stick to the topics in the course as closely as possible.
- Work in groups for several cases and projects. Obtain maximum value from this crucial aspect of this course.
- Come to class; In accordance with Harvard rules, you are expected to attend all classes, missing only rarely. There usually are students on a waiting list for the summer program courses, and we give preference to those who will engage in the courses fully. This course has enjoyed roughly 99% attendance over the past four years; don't be the 1% who misses significant material.
- If you cannot come to any single class, please obtain the notes from another student – private tutoring will not be available to those who miss class. It is important to note that any announcements in any class session are official and apply to all students registered, not just those who attend that day.
- After class, if you still don't understand a concept, please feel free to email and set up a meeting time. I'm happy to provide extra help when needed. Historically, the concepts have not been very difficult in this course but the workload is sometimes high.
- Please number your answers to all assignments so I can identify the answers.
- Due dates for all assignments are Sunday evening at 11:59 PM so I have time to look them over before class on Monday evening. Late assignments will encounter late deductions: 20% reduction between midnight and 6 AM; 40% reduction between 6 AM and noon; 60% deduction after noon; 80% deduction after 6 PM on the class day. Late assignments are unlikely to be used as examples in class.

[1] Thanks to my colleague Andy Schwarz for a previous version of this section as well as the next "How to be Successful…"

How to be Successful in this Course

I want you to be successful, not only in this course, but also in your future career. All of the material and assignments have been designed so that you are prepared for real life! To be successful in this course and your future career, consider a few suggestions:

1. Plan. You now have the syllabus for the course that includes all of the important dates. Keep track of the dates and plan your schedule around your work load.
2. Prepare. Be ready when you to come to class – read the chapters and, print out the slides (if that is your practice), the day before class so that you are not rushed coming to class. Preparing while the semester is going along will make it easier around quiz time.
3. As stated above, the workload is high but the material is fairly straightforward. The skill we emphasize in this course is analysis, integration, and generalization of concepts in diverse contexts.
4. Ask questions. The only bad question is the one that you did not ask.
5. Be professional. Think of your instructors in any courses as bosses whom you want to impress – be professional with them and they will return the favor. Also, keep up your end of the workload in your groups.
6. View this class within the right context. As in your career, don't look for shortcuts – failing to learn course material will hurt you when you are looking for a job. Start planning for your success now by treating this course as you would a job.