

**UNIVERSITY OF WISCONSIN-MILWAUKEE
SCHOOL OF INFORMATION STUDIES**

691 User-Centered Interaction Design

Syllabus

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OFFICE HOURS

Every Monday evening from 6:30 PM to 7:30 PM, I will be holding Online Office Hours using the GoToMeeting Platform. Please feel free to drop by to review solutions to recent assignments, to ask a question, to get help with your assignments, to discuss your plans for the final project, or just to say hello. Please use a headset when joining this session. You may join the GoToMeeting session using the following URL: <https://global.gotomeeting.com/join/528319981>

MEETING TIMES

Online

COURSE DESCRIPTION

Introduce human-computer interaction theories and design processes. The emphasis is on applied user experience (UX) design.

GENERAL DESCRIPTION

An introductory course in human-computer interaction, an integrated field of practice that is informed by many areas including Interaction Design, Human Factors, Usability and User Experience. The course builds a theoretical foundation for Interaction Design including understanding and conceptualizing interaction, cognitive aspects, social interaction, emotional interaction, and the nature of interfaces. Practical skills addressed include data gathering, data analysis, establishing requirements, prototyping, and evaluation.

PREREQUISITES

Graduate standing or senior undergraduate standing. For 500 and 600 level courses it is recommended that an undergraduate student first consult with the appropriate instructor and/or advisor concerning the applicability of this specific course.

OBJECTIVES

After completing this course, students should be able to:

- Articulate the theory and design practices that contribute to interaction design (Discussion; Issue Paper; Final Project).
- Articulate the cognitive, social, and emotional foundations of interaction design (Discussion; Issue Paper; Final Project).

- Assess a Web site's accessibility based upon well-established guidelines for accessibility (Web Accessibility Assessment).
- Demonstrate the ability to build prototypes at varying levels of fidelity, from paper prototypes to functional, interactive prototypes (The High-Fidelity Prototype; Final Project)
- Analyze and assess user interfaces by applying various usability criteria (The Identification of Good and Bad Interface; Usability Testing; Final project)
- Demonstrate the ability to conduct a full life cycle design project including identifying requirements, prototyping, and testing (Final Project).

ALA COMPETENCIES: [FOR MLIS COURSES ONLY]

4A. Information, communication, assistive, and related technologies as they affect the resources, service delivery, and uses of libraries and other information agencies.

4B. The application of information, communication, assistive, and related technology and tools consistent with professional ethics and prevailing service norms and applications.

4C. The methods of assessing and evaluating the specifications, efficacy, and cost efficiency of technology-based products and services.

4D. The principles and techniques necessary to identify and analyze emerging technologies and innovations in order to recognize and implement relevant technological improvements.

TIME EXPECTATIONS:

This course requires a weekly time commitment. General university guidelines indicate that a 3-credit course requires a minimum 144 hour time commitment over the semester. This time commitment represents a minimum of 9-10 hours of work per week per course. Three of these hours are lectures. Students are expected to do an additional 6-7 hours per week of study and work on assignments to achieve the learning goals of this course.

REQUIRED TEXTBOOK

Rogers, Y., Sharp, H., Preece, J. (2015) *Interaction Design: beyond human-computer interaction, 4th edition*. Wiley. ISBN : 978-1-119-02075-2

Note that this text is referred to as ID4e in the reading list below.

REQUIRED READINGS

Week 1

Shackel, B. (2009). Usability–Context, framework, definition, design and evaluation. *Interacting with Computers*, 21(5-6), 339-346.

Grudin, J. (2011). Human-computer interaction. *Annual review of information science and technology*, 45(1), 367-430.

Week 2

Hollender, N., Hofmann, C., Deneke, M., & Schmitz, B. (2010). Integrating cognitive load theory and concepts of human–computer interaction. *Computers in Human Behavior*, 26(6), 1278-1288.

Zhang, P., & Soergel, D. (2014). Towards a comprehensive model of the cognitive process and mechanisms of individual sensemaking. *Journal of the Association for Information Science and Technology*, 65(9), 1733-1756.

Week 3

Lopatovska, I., & Arapakis, I. (2011). Theories, methods and current research on emotions in library and information science, information retrieval and human–computer interaction. *Information Processing & Management*, 47(4), 575-592.

Huang, S. C., Bias, R. G., & Schnyer, D. (2015). How are icons processed by the brain? Neuroimaging measures of four types of visual stimuli used in information systems. *Journal of the Association for Information Science and Technology*, 66(4), 702-720.

Week 4

O'Brien, H. L., & Toms, E. G. (2010). The development and evaluation of a survey to measure user engagement. *Journal of the American Society for Information Science and Technology*, 61(1), 50-69.

McDonald, S., Edwards, H. M., & Zhao, T. (2012). Exploring think-alouds in usability testing: An international survey. *Professional Communication, IEEE Transactions on*, 55(1), 2-19.

Week 5

Olmsted-Hawala, E. L., Murphy, E. D., Hawala, S., & Ashenfelter, K. T. (2010, April). Think-aloud protocols: a comparison of three think-aloud protocols for use in testing data-dissemination web sites for usability. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 2381-2390). ACM.

Elling, S., Lentz, L., & De Jong, M. (2012). Combining concurrent think-aloud protocols and eye-tracking observations: An analysis of verbalizations and silences. *Professional Communication, IEEE Transactions on*, 55(3), 206-220.

Week 6

König, W. A., Rädle, R., & Reiterer, H. (2010). Interactive design of multimodal user interfaces. *Journal on Multimodal User Interfaces*, 3(3), 197-213.

Miaskiewicz, T., & Kozar, K. A. (2011). Personas and user-centered design: How can personas benefit product design processes?. *Design Studies*, 32(5), 417-430.

Week 7

Dix, A. (2010). Human–computer interaction: A stable discipline, a nascent science, and the growth of the long tail. *Interacting with Computers*, 22(1), 13-27.

Week 8

Palanque, P., Ladry, J. F., Navarre, D., & Barboni, E. (2009). High-Fidelity prototyping of interactive systems can be formal too. In *Human-Computer Interaction. New Trends* (pp. 667-676). Springer Berlin Heidelberg.

Gonçalves, J., & Santos, C. (2011). POLVO-software for prototyping of low-fidelity interfaces in agile development. In *Human-computer interaction. Design and development approaches* (pp. 63-71). Springer Berlin Heidelberg.

Week 10

Yamamoto, Y., & Nakakoji, K. (2005). Interaction design of tools for fostering creativity in the early stages of information design. *International Journal of Human-Computer Studies*, 63(4), 513-535.

Asselin, M., & Moayeri, M. (2010). New tools for new literacies research: an exploration of usability testing software. *International Journal of Research & Method in Education*, 33(1), 41-53.

Week 11

Hourcade, J. P. (2008). Interaction design and children. *Foundations and Trends in Human-Computer Interaction*, 1(4), 277-392.

Zhou, J., Rau, P. L. P., & Salvendy, G. (2012). Use and design of handheld computers for older adults: A review and appraisal. *International Journal of Human-Computer Interaction*, 28(12), 799-826.

Week 12

Leuthold, S., Bargas-Avila, J. A., & Opwis, K. (2008). Beyond web content accessibility guidelines: Design of enhanced text user interfaces for blind internet users. *International Journal of Human-Computer Studies*, 66(4), 257-270.

Sahib, N. G., Tombros, A., & Stockman, T. (2012). A comparative analysis of the information-seeking behavior of visually impaired and sighted searchers. *Journal of the American Society for Information Science and Technology*, 63(2), 377-391.

Xie, I., Babu, R., Joo, S. & Fuller, P. (2015). Using digital libraries non-visually: understanding the help seeking situations of blind users. *Information Research*, 20(2), paper 673. Retrieved from <http://InformationR.net/ir/20-2/paper673.html>

Week 13

Petrie, H., & Bevan, N. (2009). The evaluation of accessibility, usability and user experience. *The universal access handbook*, 10-20.

Hertzum, M., Molich, R., & Jacobsen, N. E. (2014). What you get is what you see: revisiting the evaluator effect in usability tests. *Behaviour & Information Technology*, 33(2), 144-162.

Week 14

Stefano, F., Borsci, S., & Stamerra, G. (2010). Web usability evaluation with screen reader users: implementation of the partial concurrent thinking aloud technique. *Cognitive processing, 11*(3), 263-272.

Fernandez, A., Insfran, E., & Abrahão, S. (2011). Usability evaluation methods for the web: A systematic mapping study. *Information and Software Technology, 53*(8), 789-817.

Week 15

Hornbæk, K. (2010). Dogmas in the assessment of usability evaluation methods. *Behaviour & Information Technology, 29*(1), 97-111.

Lee, Y., & Chen, A. N. (2011). Usability design and psychological ownership of a virtual world. *Journal of Management Information Systems, 28*(3), 269-308.

SOFTWARE

Students will be expected to use software during the course when doing activities like usability studies and prototyping. Rather than require that students only use one product for a particular activity, a list of acceptable products will be discussed with the class before each assignment. Students may recommend additional software choices. These recommendations will be subject to review and approval by the instructor.

INSTRUCTIONAL METHODS

Lecture, discussion, and demonstrations.

Students with special test and note-taking needs should contact the instructor as early as possible for accommodations.

COURSE SCHEDULE

A Note Regarding the Schedule: The schedule presented in the table below is a summary of the schedule as it exists before the beginning of the semester. **An official, more detailed, electronic version of schedule will be maintained on our Weekly Schedule application which will be available at the following URL:**

http://courseinfo.ligent.net/2017sp/_uwm/infost691_206_207/index.html

The Weekly Schedule is always subject to reasonable change by the instructor to account for changes in circumstance and to correct errors. When changes are made to the schedule, they will be announced via D2L Announcements and email.

| Week | Topics | Readings | Assignments Due week |
|------|---|---|---|
| 1 | Introduction, Conceptualizing Interaction | ID4e chaps 1, 2 Shackel (2009) Grudin (2011) | |
| 2 | Cognitive Aspects, Social Interaction | ID4e chaps 3, 4 Hollender, Hofmann, Deneke & Schmitz (2015) Zhang & Soergel (2014) | |
| 3 | Emotional Interaction, Interfaces | ID4e chaps 5, 6 Lopatovska & Arapakis (2011) Huang, Bias & Schnyer (2015) | Identification of Best and Worst Interfaces |
| 4 | Understanding User Needs: Data Gathering | ID4e chap 7 O'Brien & Toms (2010) McDonald, Edwards & Zhao (2012) | |
| 5 | Data Analysis | ID4e chap 8 Olmsted-Hawala, Murphy, Hawala & Ashenfelter (2010) Elling, Lentz & De Jong (2012) | Web Accessibility Assessment |

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| 6 | Process of Interaction Design | ID4e chap 9 König, Rädle & Reiterer (2010) Miaskiewicz & Kozar (2011) | |
| 7 | Establishing Requirements | ID4e chap 10 Dix (2010) | Final Project Proposal |
| 8 | Design, Prototyping, Construction | ID4e chap 11 Palanque, Ladry, Navarre & Barboni (2009) Gonçalves & Santos (2011) | |
| 9 | Spring Recess | N/A | N/A |
| 10 | Interaction Design in Practice: Design tools | ID4e chap 12 Yamamoto & Nakakoji (2005) Asselin & Moayeri (2010) | The High-Fidelity Prototype |
| 11 | Interaction Design for Specific Types of Users | Hourcade (2008) Zhou, Rau & Salvendy (2012) | |
| 12 | Interaction Design for People with Disabilities | Leuthold, Bargas-Avila & Opwis (2008) Sahib, Tombros & Stockman (2012) Xie, Babu, Joo & Fuller (2015) | |
| 13 | Introducing Evaluation | ID4e chap 13 Petrie & Bevan (2009) Hertzum, Molich & Jacobsen (2014) | Issue Paper (Graduate students only) |
| 14 | Evaluation: Usability Studies | ID4e chap 14 Stefano, Borsci & Stamerra (2010) Fernandez, Insfran & Abrahão (2011) | |
| 15 | Evaluation: Inspections, Analytics, Models | ID4e chap 15 Hornbæk (2010) Lee & Chen (2011) | Usability Testing |

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|----|-----------------------|--|-------------------------------------|
| 16 | Project Presentations | | Final Project Presentation & Report |
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ASSIGNMENTS

Course Elements:

1. Readings

Required readings will be assigned from the resources listed above and from other resources that will be identified in the schedule. Generally, readings are chosen to accompany any lecture or demonstration for the week. So, you should expect to complete the readings before the lecture or demonstration.

Optional readings will be assigned from time to time. These will typically represent alternate expressions of the same material, or interesting supplementary topics.

2. Practice Assignments

A number of practice assignments will be due at regular intervals throughout the semester. These have been designed to provide you with an opportunity to practice individual skills learned during the course prior to utilizing those skills in the Final Project (see below). Substantial class time will be devoted to reviewing student (and instructor) solutions to practice assignments. Practice assignments must be submitted before the class in which they will be discussed.

Practice assignments will include the following:

a. The Identification of Good and Bad Interface (due week 3)

Everyone is required to present one best or worst interface in class. The presentation should be 5 -7 minutes and discuss the interface features. Students need to justify their arguments about why it is good or bad by applying what you have learned in class.

b. Web Accessibility Assessment (due week 5)

Assess the accessibility of a Web site of your choice. Based on Web Content Accessibility Guidelines (WCAG) 2.0, students need to check the site and write a 500 word evaluation of the site's compliance with the Guidelines.

c. The High-Fidelity Prototype (due week 9)

Build a high-fidelity prototype of an application that you choose (e.g. shopping, travel, searching). Students can choose to use tools taught or recommended in class. In addition, create a tutorial about how to use the prototype with justification.

d. Usability Testing (due week 15)

Conduct a usability test on a selected user interface. Students need to recruit 3 to 5 subjects, and create multiple data collection instruments including questionnaire, think aloud and interview. Data analysis needs to focus on how to improve the design of the interface.

Fuller assignment descriptions, instructions, and grading rubrics will be provided separately.

3. *Issue Paper (Graduate Students Only, due week 13)*

Each graduate student will write a research paper regarding a specific issue of human-computer interaction, such as how to design for people with disabilities, the pros and cons of different prototyping approaches. The emphasis is on the identification of challenges of the issue and how to solve these challenges. Your paper should be about 1500 to 2000 words. In addition, you need to cite a minimum of 10 sources.

Detailed instruction of the paper will be provided separately.

4. *Final Project (due week 7 & 16)*

Each student will plan and execute a full life cycle project including identification and analysis of users and requirements, preliminary design, low-fidelity and high-fidelity prototyping, testing, presenting the completed project to the class. Projects will be proposed by students and will represent either real or simulated workplace scenarios.

Project submissions will consist Project Proposal and Project Report.

Overall project requirements, instructions for individual deliverables, and grading rubrics for individual deliverables will be provided separately.

5. *Class Participation*

- a. Each student is expected to contribute 4 significant (300 – 400 word) posts to the discussion forums for the class. These should include:
 - i. 1 post to the *Introduce Yourself Forum* during Week 1 of the semester.
 - ii. 3 posts to the *Articles Discussion Forum* during the semester. Each of these posts should summarize the findings of the paper and discuss the implications of those findings for the interaction design practitioner. To qualify, posts must be made by the week closing deadline for the week in which the article has been assigned.
- b. Each student is expected to read all posts of other students made in all discussion forums and respond with short posts when appropriate.
- c. Every Monday evening from 6:30 PM to 7:30 PM, I will be holding Online Office Hours using the GoToMeeting Platform. Please feel free to drop by to review solutions to recent assignments, to ask a question, to get help with your assignments, to discuss your plans for the final project, or just to say hello. Officially, this session is optional.

Yet, I am confident that you will find these sessions helpful. So, I encourage you to attend as many of these sessions as possible. Please use a headset when joining this session. You may join the GoToMeeting session using the following URL: <https://global.gotomeeting.com/join/528319981> . Additional participation credit will be given to those students who attend Online Office Hours sessions and participate.

EVALUATION

| Evaluation | Undergraduate Students | Graduate Students |
|--|-------------------------------|--------------------------|
| Practice Assignments | 40% | 30% |
| The Identification of Good and Bad Interface Web | 5% | 5% |
| Accessibility Assessment | 10% | 5% |
| The High-Fidelity Prototype | 10% | 7% |
| Usability Testing | 15% | 13% |
| Issue Paper | N/A | 20% |
| Final Project | 40% | 30% |
| Class Participation | 20% | 20% |
| Total | 100% | 100% |

GRADING SCALE

| | | | |
|--------|----|----------|----|
| 96-100 | A | 74-76 | C |
| 91-95 | A- | 70-73 | C- |
| 87-90 | B+ | 67-69 | D+ |
| 84-86 | B | 64-66 | D |
| 80-83 | B- | 60-63 | D- |
| 77-79 | C+ | Below 60 | F |

UWM AND SOIS ACADEMIC POLICIES

The following links contain university policies affecting all SOIS students. Many of the links below may be accessed through a PDF-document maintained by the Secretary of the University: <http://www.uwm.edu/Dept/SecU/SyllabusLinks.pdf>. Undergraduates may also find the *Panther Planner and Undergraduate Student Handbook* useful (<http://www4.uwm.edu/osl/students/>).

Students With Disabilities

If you will need accommodations in order to meet any of the requirements of a course, please contact the instructor as soon as possible. Students with disabilities are responsible to communicate directly with the instructor to ensure special accommodation in a timely manner. There is comprehensive coverage of issues related to disabilities at the Student Accessibility Center (<http://www4.uwm.edu/sac/>), important components of which are expressed here: <http://www.uwm.edu/Dept/DSAD/SAC/SACltr.pdf>.

Religious Observances

Students' sincerely held religious beliefs must be reasonably accommodated with respect to all examinations and other academic requirements, according to the following policy: <http://www4.uwm.edu/secu/docs/other/S1.5.htm>. Please notify your instructor within the first three weeks of the Fall or Spring Term (first week of shorter-term or Summer courses) of any specific days or dates on which you request relief from an examination or academic requirement for religious observances.

Students Called to Active Military Duty

UWM has several policies that accommodate students who must temporarily lay aside their educational pursuits when called to active duty in the military (see <http://www4.uwm.edu/academics/military.cfm>), including provisions for refunds, readmission, grading, and other situations.

Incompletes

A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantial cause beyond the student's control, has been unable to take or complete the final examination or some limited amount of other term work. An incomplete is not given unless the student proves to the instructor that s/he was prevented from completing course requirements for just cause as indicated above (<http://www4.uwm.edu/secu/docs/other/S31.pdf>).

Discriminatory Conduct (such as sexual harassment)

UWM and SOIS are committed to building and maintaining a campus environment that recognizes the inherent worth and dignity of every person, fosters tolerance, sensitivity, understanding, and mutual respect, and encourages the members of its community to strive to reach their full potential. The UWM policy statement (<http://www4.uwm.edu/secu/docs/other/S47.pdf>) summarizes and defines situations that constitute discriminatory conduct. If you have questions, please contact an appropriate SOIS administrator.

Academic Misconduct

Cheating on exams and plagiarism are violations of the academic honor code and carry severe sanctions, ranging from a failing grade for a course or assignment to expulsion from the University. See the following document (<http://www4.uwm.edu/osl/dean/conduct.cfm>) or contact the SOIS Investigating Officer (currently the Associate Dean) for more information.

Complaints

Students may direct complaints to the SOIS Dean or Associate Dean. If the complaint allegedly violates a specific university policy, it may be directed to the appropriate university office responsible for enforcing the policy (<http://www4.uwm.edu/secu/docs/other/S49.7.htm>).

Grade Appeal Procedures

A student may appeal a grade on the grounds that it is based on a capricious or arbitrary decision of the course instructor. Such an appeal shall follow SOIS appeal procedures for undergraduates as seen here: (<http://www4.uwm.edu/sois/programs/graduate/mlis/policies/appeals.cfm>) In the case of a graduate student, the Graduate School, (http://www4.uwm.edu/sois/programs/undergraduate/ug_appeals.cfm).