

# I270 Introduction to Human-Computer Interaction: Principles and Practice

Indiana University School of Informatics - IUPUI  
Fall 2010

**Section Number:** 28865  
**Classroom:** IT 257  
**Meeting Time:** Mon. 3:00-5:40 pm  
**Credit Hours:** 3 CR

**Instructor:** William Ryan  
**Office Address:** IT 580  
**Office Phone:** 278-0046  
**Office Hours:** (IT 580) Tues. 3:00-4:00 pm, Tues. 5:30-6:30 pm,  
Weds. 1:00-2:00 pm,  
(IT 257) Fri. 1:00-2:00 pm

**Email Address:** [wnryan@iupui.edu](mailto:wnryan@iupui.edu)

## **Mission Statement**

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning
- Research, Scholarship, and Creative Activity
- Civic Engagement

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community
- A commitment to ensuring diversity, and
- Pursuit of best practices

IUPUI's mission is derived from and aligned with the principal components – Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices – of Indiana University's Strategic Directions Charter.

## **Statement of Values**

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community; both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.

## **Required Text:**

**Title:** Don't Make Me Think: A Common Sense Approach to Web Usability  
(Second Edition)  
**Author:** Steve Krug  
**Year:** 2006

**Publisher:** New Riders  
**ISBN:** 0-321-34475-8

### **Equipment Needed:**

If you are a declared Informatics major, please visit <http://informatics.iupui.edu/technology/laptop> for information on the Laptop Initiative for Informatics majors.

You will also need sketching equipment (e.g., sketching pad and pencils, pens, or markers), access to a scanner, access to and rudimentary understanding of HTML/PowerPoint/Photoshop

### **Course Description:**

This course will introduce Informatics undergraduates to the fields of Human-Computer Interaction (HCI). This focuses on the *use* of computing technology. From this perspective, we can understand how various technologies fit into users' lives more effectively and can extend users' cognitive capabilities through designing new experiences for them in HCI. The course will introduce you to the design process that accompanies software development.

The course is divided into two main activities of interaction designers. The first activity deals with the design process of software and hardware technology and the relation of our designs to the user. Examples of design include learning about our software users, sketching and brainstorming different design alternatives, and developing prototypes. The second important activity is evaluation of the generated designs. Examples of evaluation include expert evaluation, usability studies and field studies.

I hope that over the course of the semester you will gain a new understanding and appreciation for the users of your software. This appreciation then can be used to help generate design insight. This course is intended primarily for students wishing to become designers of interactive software and media; however, it is also applicable for technical students who wish to learn more about the users of software that they develop. The course will focus on design activities including design and concept generation, user modeling, low fidelity prototyping, testing, presentation, critique, and so forth.

Here is the official course description, which will be infused into our activities in the class:

#### **From School Website**

Students learn the fundamental principles and practices of human-computer interaction (HCI) and evaluation. Specific focus is given to the introductory knowledge of HCI methods, tools, and techniques for designing and evaluating user interfaces using low and high fidelity prototypes for the Web and software.

## Course Objectives:

By the end of this course, you will be able to:

- Understand and explain a range of foundational HCI terms and topics, such as:
  - HCI basics, interaction design, and related areas
  - HCI conceptual models
  - User needs/requirements and product assessments
  - The processes/life-cycle of interaction design
  - Interface design and prototyping
  - A user-centered approach to interaction design
  - Product evaluation/testing methods
- Identify what tools and techniques exist for interaction designers to scaffold the process of design as well as the limitations of these techniques.
- Collect information from potential users that give evidence to what user's needs are as well as how potential designs could fit into their daily habits.
- Analyze user needs and requirements.
- Balance values, needs, and requirements from multiple stakeholders in a design project and generate a list of viable and innovative concepts that fit the design space.
- Apply a user-centered approach to interaction design, user profiling to interaction design, and interface design principles and processes.
- Participate in the process of design as well as integrate design into a software development process.
- Construct a well-reasoned argument supporting decisions in a design process.
- Critically evaluate interactive software and system designs.
- Test software designs based on several different evaluative techniques for example conducting basic usability studies or perform a basic heuristic evaluation.

## Core Competencies:

With respect to the IUPUI Principles of Undergraduate Learning, you can expect through this class to achieve competencies in the following areas:

### 1. Critical Thinking

- Students will assess and identify user profiles, i.e. user requirements/needs and cognitive processes/mental models for product development.
- Students will apply and translate user profile information into product specifications.
- Students will analyze test data from which to draw some well-supported conclusions about the interactive products they have designed.
- Students will identify, analyze, discuss and debate various topics in class discussions.
- The students will engage in critique during the presentations of other classmates and be able to respond politely and constructively when their work is critiqued.

## 2. Application of knowledge

- The class will be practice oriented, allowing students to gain a hands-on knowledge on the concepts about which they learn in HCI.
- Students will blog about HCI in their own lives and about how the principles they learn in class can help them become better designers and users of technology.
- A list of web resources will be provided for students to engage with the larger field of HCI.

## 3. Oral presentation:

- Students will have the opportunity several times throughout the class to present work-in-progress ideas to the class.
- Students will also be required to give a formal presentation of group work for the final project on the last day of class.
- Students will learn to provide and receive critical, constructive feedback about theirs and others work.
- Every student will have the opportunity to practice oral presentation in the presentation of class readings.
- The instructor will prepare students for the final presentation through a discussion on effective presentation techniques before the final presentation.
- Collaborate with team members on many levels included in the product design process, including creative problem solving in the design process and critical thinking in the design validation process, as outlined below.

## **Expectations/Guidelines/Policies:**

### **Attendance Policy**

Attendance is required. The University regulations state: “Students are expected to be present for every meeting of the classes in which they are enrolled.” IUPUI faculty are required to submit to the office of the Registrar a record of student attendance through the semester, on which they will take action if the record conveys a trend of absenteeism. As a result, attendance will be taken in all classes.

- If you do not sign your name while in class, you will be marked absent.
- Signing the attendance sheet for another student is absolutely prohibited. Any student found doing so will be in violation of university policies on ethics and/or conduct.

### ***Important: Missing classes will affect your grade***

You are allowed two unexcused absences before your grade will be affected. Missing class means you do not show for the entire evening of class. The grade reduction policy works in this way.

- On the third missed class, your final grade will drop 5 percent (regardless of the reason).
- On the fourth missed class, your final grade will drop 10 percent (regardless of the reason).
- On the fifth missed class, your final grade will drop 15 percent (regardless of the reason).
- On the sixth missed class, a grade of “F” will be issued for the course or the student will have the option of dropping the course.

### **Class Tardiness**

You are expected to be to every class on time. Problem lateness will be considered as being more than 15 minutes late to class. The first time you are late to class you will be warned regardless of the excuse. Every subsequent time you are more than 15 minutes late to class regardless of the excuse will be recorded as an unexcused absence. ***Please plan ahead and allow yourself enough time for traffic, parking, and general travel to class.***

### **Facebook/Web/Computer/Cell Phone Use**

For the entire class period, your attention is expected to be on lecture or classwork. Although I am aware that you are quite adept at multitasking, I ask that you focus on one thing during class. I want to eliminate distractions during class.

### **Incomplete Grade**

Incompletes will not be issued except under extreme personal conditions that have been reviewed by the Dean's Office.

### **Class Content**

All material covered in class or any assignments made during class are your responsibility. In other words, if you miss class, you are responsible to find out what was covered, whether course content, an assignment, or a revision to a due date, time, or place of an assignment.

### **Assignments and Due Dates**

All assignments must be ready to hand in at the designated time and place. All assignments handed in late will be reduced by 10 points for every day late from the date and time of assignment deadline.

### **Academic Integrity and Plagiarism**

You are expected to submit your *own* work for reading responses, quizzes, blog entries, projects, and exams; however, finding other sources that support claims or design decisions that you are making are perfectly reasonable activities as long as you properly cite the source that you are using. If you do bring in other sources, you are expected to add your own insights in addition to the text, diagrams, or designs that you incorporate into your design.

You are encouraged to consult with your classmates as you work on projects and assignments (collaborations and cheating on quizzes and exams will result in failure for all parties involved), but you are expected to turn in your own original work for each assignment. Using another student's work on a project or assignment, cheating on an exam, or any other form of dishonesty or plagiarism will result in a grade of zero on that assignment and possibly an "F" in the course, and all parties involved will be referred to the Dean of Students. If you would like to review your rights and responsibilities as set out by the university, please visit <http://www.iupui.edu/code/>.

### **Bringing Others to Class**

The university policy on the attendance of children to class is:

"Children are not permitted to attend class with parents, guardians, or childcare providers. This conduct has the effect of unreasonably interfering with an individual's work or academic performance creating an offensive learning environment."

If you want to bring a friend or prospective student who is interested in the class, please contact the instructor a week before the class the student wishes to attend.

## Assignments

### Assessing Your Retention of Class Readings:

Each student should not only read but also arrive at a competent understanding of the content of the readings so you can be engaged in a group discussion during class time. Weekly reading is an important part of this class. ***Weekly quizzes will be posted to assess your reading retention.***

### Quizzes on Readings

Quizzes will be posted to OnCourse based on the readings each week. You will be quizzed over the material you read in this course to determine basic mastery and participation in the subject material. You will be graded on each quiz using the grading scale outlined in this syllabus.

The quiz will be available prior to class the week *before* the reading assignment is due. You will have until the end of the day (11:59 PM) that the assignment is due to complete the quiz. For example, the first quiz will be released prior to the first day of class. You will have until 11:59 PM the following Monday to complete it.

### Reading Presentation and Discussion

- During many class sessions, readings will be presented by one of you. *This does not relieve the rest of the class members from reading the material before class.*
- The presentation is conducted informally, without visual aids.
- You will have approximately 10-12 minutes to present your view of the materials. ***Do not just read the material to the class...we already know what it says (or should)! If you start doing that, I am going to interrupt and ask you to summarize it without looking down.***
- After presenting the material, the whole class will have additional time to ask questions, debate, or discuss whatever issues are relevant. ***The rest of the class is now responsible for carrying the discussion.***
- A key point is that the session should be informal, but orderly; with the goal that you all gain new knowledge on the subject and are challenged on your understanding of the issues.
- This presentation will be a component that factors into the participation grade.
- A signup sheet will be circulated on the first day of class.

### Blogs

Each student will be responsible for setting up an account on <http://www.wordpress.com/> by the Wednesday after the first class period (Wednesday, August 25) at 5 PM. You will need to send the instructor the email that you used to register this account before class that day.

On the blog, you will be given occasional assignments requiring you to think critically about HCI, design, usability evaluation, and software systems and devices in your life. Blog posts will be due one week after the class they are assigned and must be completed by 11:59 PM that class day. The first two blog assignments are required. Five more blog

posts will be assigned, but you will be required to complete only three more blogs for credit. Blogs will be graded on the following basis.

- **4 points**, Excellent work, showing a great deal of critical thought about the topic.
- **3 points**, Good work, responded to the blog assignment, but did not critically engage with the topic.
- **2 points**, Sloppy work, did the assignment, but did not really address the core of the problem.
- **1 point**, Incomplete, did not address the assignment at all or work is unsatisfactory.
- **0 points**, Not done at all or the work was plagiarized.

Doing additional blog posts, commenting on other students blog posts, and posting to the blog on class relevant topics can all significantly aid your participation grade.

### **Projects**

There will be two projects assigned during the first half of the semester. The projects will engage your analytical and design abilities as well as prepare you to complete the final project.

#### *Project #1 : System Redesign*

- This project will be completed individually.
- This project will involve re-design work for a software system or device including explaining why the software system or device may be problematic for a particular audience and generating several design alternatives that may be able to address the problem.
- Complete project details will be presented to you during Week 2 of class (August 30).
- The project will be due on Week 5 before the start of class on Monday (September 20).\*

#### *Project #2 : Design from Scratch*

- This project will be completed in a group.
- This project will involve design work for a fictional client. The design work will involve learning about a particular user group, generating design alternatives, creating a paper prototype, a video prototype, and testing the project with heuristic evaluation.
- Complete project details will be presented to you during Week 5 of class (September 20).
- The project will be due on Week 11 before the start of class on Monday (November 1).\*

\* This due date may be altered at my discretion, but a formal announcement will be made in class and posted on OnCourse.

## Final Project

The final project uses the skills developed through the previous two projects. This final project will require choosing a design topic from a list provided by the instructor and performing the entire user-centered process to create an original design addressing an identified problem or need for your target user group.

Final deliverables:

- Final presentation.
- Group member evaluations
- Submission packet, to consist of diary or report, scans, etc. The packet should leave no doubt about how your project went, what you did, how you did it, and what the final outcomes were. They will include:
  - User analysis, personas and scenarios created.
  - Sketches of design alternatives brainstormed.
  - A final design. This does not have to be large, but it does have to include user interaction. In other words, it cannot be just informational. It has to do something.
  - Paper Prototype
  - Heuristics used, user testing procedures, and results.
  - Your lessons learned from testing and how these lessons were applied to the final product.
  - CD/DVD with High Fidelity Prototype.
  - Final report. Much of this will be written, at least 10 pages, and probably much more including all the supporting material. The final report will include everything done in the final project, including copies of the prototypes and the final design. The final report gets EVERYTHING. Detail in here how testing was done, the actual data, and so forth. In the report, be sure to identify what part was done by each team member.

Comprehensive detail will be provided on Week 11 (November 1). The final project presentations will be during class time on the final day of class on Week 16 (December 6) and final project materials will be due during finals week at 5 PM on Monday, December 13.

Final project grade will be based **80%** on the quality of your work and **20%** on your average group evaluation scores.

## Midterm Exam

There will be a midterm exam over material presented in class and in the textbook. It will be administered entirely in Oncourse. You will have a 48 hour period in which to start the exam from when it is released to you. You will need to block off 90 minutes to complete the exam. ***You will only be able to log in one time to complete the exam.***

Test questions will be randomized from a pool of questions. ***Each exam will be different.***

If you have the proper documentation from Adaptive Services, modifications to the exams will be made for you. Notify us at the beginning of the semester, *not the week of the exam*.

### Course Grading Breakdown

- Individual Project #1 10 %
- Group Project #2 20 %
- Group Final Project 30 %
- Midterm Examination 15 %
- Blog Assignments 10 %
- Quizzes 5 %
- Participation\*\* 10 %

\*\* Participation and engagement with course, e.g.:

- Physically attending office hours.
- Thoughtful posts and comments to the blog website beyond what is required by the course.
- General preparedness for the course.
- Participation in class discussions.
- Responding to instructor requests for information in a timely manner.
- Class reading presentation.

### Basic Grading Scale

A+	(>100%)	=	Professional level work, showing highest level of achievement.
A	(93-99%)	=	Extraordinarily high achievement, quality of work; shows command of the subject matter.
A-	(90-92%)	=	Excellent and thorough knowledge of the subject matter.
B+	(87-89%)	=	Above average understanding of material and professional quality of work.
B	(83-86%)	=	Signifies mastery and fulfillment of all course requirements; Good, acceptable work.
B-	(80-82%)	=	Satisfactory quality of work.
C+	(77-79%)	=	Minimally acceptable performance and quality of work; partial mastery.
C	(73-76%)	=	Unacceptable work, does not demonstrate mastery.
C-	(70-72%)	=	Unacceptable work.
D+	(67-69%)	=	Unacceptable work.
D	(63-66%)	=	Unacceptable work.
D-	(60-62%)	=	Unacceptable work.
F	(< 60%)	=	Failure.

## Class Calendar

*This calendar is subject to change.*

Week #	Dates	Lecture Topic	Activity	Assignment Due***	Project Info
1	8/23	What is HCI? UXD, ID, UCD, IA	Design Activity, involving entire UCD		
2	8/30	Users, personas and introduction to understanding users	Creation of personas and scenarios from user research	<b>Read</b> Krug [Foreword, Introduction, CH1-2] <b>Read</b> Calabria article on personas <b>Quiz</b> on HCI and personas <b>Blog #1</b>	Project #1 announced.
3	9/6	<b>Labor Day.</b>			
4	9/13	Human cognition and principles of interaction design	Design activity leveraging principles of human cognition	<b>Read</b> Krug [CH 3-6] <b>Read</b> all 4 Nielsen articles on heuristic analysis <b>Read</b> Shaffer excerpt on principles <b>Quiz</b> on heuristic analysis and design principles	
5	9/20	Understanding users: Interview, observation, surveys	Group exercise designing questionnaire and plan for observation	<b>Read</b> Berger excerpt on interviews and observation <b>Read</b> Shaffer excerpt on data analysis <b>Quiz</b> on learning about users	Project #1 due. Project #2 announced.
6	9/27	Designing and sketching and brainstorming	Design activity involving rapid design iteration	<b>Read</b> Krug [CH 7-8] <b>Read</b> Buxton excerpt on sketching and design <b>Quiz</b> on design <b>Perform</b> observation of people for 30 minutes or interview of 2 people <b>Blog #2 Findings</b>	
7	10/4	The design team, design and product lifecycle	Video on team process		
8	10/11	Paper prototyping	Design activity and use paper prototype to build it. Present and Critique.	<b>Read</b> Rudd et al. article on low-fi and high-fi prototyping <b>Read</b> Snyder article on paper prototyping <b>Quiz</b> on prototyping	Final Project announced.

				<b>Blog #3</b>	
<b>9</b>	10/18	<b>Fall Break.</b>			
<b>10</b>	10/25	Activities, tasks, and task analysis.	Task analysis activity. <b>Project Work Time</b>	<b>Read</b> Norman on activity-centric design <b>Read</b> Rauterberg on task analysis <b>Read</b> Hornsby on HTA <b>Quiz</b> on tasks and activities	
<b>11</b>	11/1	Usability testing and interpreting test results.	Usability test on software prototype. <b>Review</b>	<b>Read</b> Krug [CH 9-10] <b>Quiz</b> on usability <b>Midterm exam.</b> <b>Blog #4</b>	Project #2 due.
<b>12</b>	11/8	High-fidelity prototyping	Building a prototype in high-fidelity prototyping tools.	<b>Read</b> Krug [CH 11-12]	
<b>13</b>	11/15	Trends in HCI research	Videos of new technology in HCI. <b>Project Work Time</b>	<b>Read</b> Harper et al. excerpt [pp. 12-51] <b>Quiz</b> on future HCI <b>Blog #5</b>	
<b>14</b>	11/22	Discussions on the business of HCI and ethics in HCI	Discussions	<b>Read</b> Friedman article on design ethics <b>Quiz</b> on ethics in HCI <b>Blog #6</b>	
<b>15</b>	11/29		<b>Project Work Time</b>		
<b>16</b>	12/6	In-class presentations and critique		<b>Blog #7</b>	Final Project Presentations due.
<b>Final</b>	12/13				Final Project Submission Packet due.

\*\*\* Krug Book is required text and all CH# in assignments reference the chapter number. All other articles will be available on OnCourse through the resources or library resources section.