

# I543

## Usability and Evaluative Methods in Interactive Design

Indiana University School of Informatics - IUPUI

Fall 2006			
Course Information			
3 Credit Hours	Room: IT 265	Thursday 5:45 – 8:25	Section: 0100

**Instructor:** Dr. Anthony Faiola, MFA, Ph.D.  
Associate Professor  
Associate Director, HCI Graduate Program  
Adjunct Associate Professor, School of Engineering and Technology

**Office Address:** IT, Room 485  
535 W. Michigan Street  
IT Building, Room 485  
Indianapolis, IN 46202-3216  
Indiana University - School of Informatics (IUPUI)

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

**Faculty Website:** <http://informatics.iupui.edu/p/7>

**Phone:** Office: 317-278-4141 / Home: 765-463-6864 / Cell: 765-543-9036

**Office Hours:** Wed & Thu – 4:30-5:30pm and 8:25-9:25pm

**General Policy:** Contact Dr. Faiola by phone and email anytime.

**Contact by Phone:** Everyday, 8AM to 8PM

**Contact by Email:** 24/7 (Response will generally be ASAP.)

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### MISSION & STATEMENT OF VALUES

The Mission of IUPUI is to provide for its constituents excellence in Teaching and Learning, Research, Scholarship, and Creative Activity, and Civic Engagement. With each of these core activities characterized by: 1) collaboration within and across disciplines and with the community, a commitment to ensuring diversity, and 3) 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.

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.

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## COURSE DESCRIPTION

Web usability principles (theory) and practices are covered with a semester long project that draws upon relationships between Web interface design and usability engineering. Students learn a collection of requirements process and testing techniques.

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## REQUIRED COURSE TEXT

- **Title:** Design Web Sites that Work: Usability for the Web
- **Author:** Gerble, Brinck, and Wood
- **Copyright:** 2002 (**ISBN:** 1-55860-658-0)
- **Publisher:** Morgan Kaufmann Publishers
  
- **Author:** OnCourse
- **Title:** Various papers

## OPTIONAL READING

- **Author:** Joseph S. Dumas & Janice C. Reish
- **Title:** A Practical Guide to Usability Testing
- **Publisher:** Ablex Publishing (**SBN:** 0-89391-990-x)

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## RECOMMENDED ON-COURSE MATERIALS

- **Supplemental course materials will be post on OnCourse for students to download.**

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## EQUIPMENT & SOFTWARE NEEDED

- Sketching pad, pencils, pens, etc. for prototyping
- No programming knowledge is required in this course. However, use of authorware/software and some HTML will be used to design and “mock up” prototypes and for writing papers and reports.

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## COURSE OUTCOMES

The learning outcomes of this course will include each student acquiring the skill to:

1. **Explain terms and concepts related to the following range of interface design and usability topics:**
  - Usability theory and the applied techniques
  - A user-centered approach to interaction design
  - The purpose of the graphic user interface
  - Principles of the interface design and prototyping processes
  - Interface grids and typographical devices
  - Interface design standards / guidelines for cross cultural and disabled users
  - Information architecture and content management
  - Classic user testing theory and tools
2. **Design a Web site up to the dynamic prototype stage by applying usability principles and models, i.e. they will:**
  - Execute pre-design and post-design usability testing techniques on the developed Web site.
  - Assemble and analyze the testing data.
  - Write a comprehensive report on the product development process of a Web site, i.e. of the stages of pre-design, design, and post-design, testing, and data analysis

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## COURSE OBJECTIVES

The learning objectives of this course include:

**1. Obtaining knowledge about interface design and usability, i.e. students will recognize and discuss:**

- The purpose of the graphic user interface and usability terms and principles
- User-centered approach
- User profiling
- Interface design principles and processes
- Information architecture and content management
- Principles of the interface design and prototyping processes, such as grids and typographical devices
- Interface design standards / guidelines for cross cultural and disability users
- Usability theory and the applied techniques

**2. Web product development, i.e., students will redesign one Web site that includes the stages of:**

- Assessing user needs and requirements
- Categorizing, designing, and building information in proper architectural structures
- Adapting usability principles and a user-centered approach to interaction design
- Creating interface design prototypes based on a range of design principles and user data
- Applying evaluation and usability testing methods to the Web product to validate design decisions using: a) The Classic user testing, and b) Heuristic inspection
- Analyzing test data and then writing a comprehensive report on the product development process of their redesigned Web site, i.e. of the stages of pre-design, design, and post-design, testing, and data analysis.

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## CORE COMPETENCIES:

Using the IUPUI Principles of Undergraduate Learning (PUL), core competencies are reflected in the following areas:

**A. Related to Communication Skills - Students will be able to:**

- Communicate information and ideas clearly and effectively in written and spoken form through group and class discussions, presentations, and projects on various interface design and usability topics taken from the weekly readings and project reports.
- Use communication media (software), i.e. word processing and other graphic and presentation technologies.
- Demonstrate effective:
  - Listening skills through group (team) and class discussions
  - Reading and comprehension skills through weekly reading assignments, discussions, and presentations to the class.
- Compile a final research report based upon background assessment of product usability
- Collaborate with team members on many levels in the product design process, including creative problem solving in the design process and critical thinking in the design validation and product testing process, as outlined below.

**B. Related to Critical Thinking and Creative Problem Solving Skills - Students will be able to:**

- Assess and identify user profiles, i.e. user requirements/needs and cognitive processes/mental

models for product development

- Apply and translate user profile information into product specifications for interface designs
- Analyze test data from which to draw some well-supported conclusions about the interactive products they have designed.
- Identify, analyze, discuss, and debate various design and testing issues in the weekly group discussion and product development time

### C. Related to Intellectual Adaptability and Understanding – Students will be able to:

- Identify the historical implications of HCI and usability on current and future digital online products that affect the way people live, learn, work, play, and communication today and in the future.
- Recognize the social implications and moral and ethical responsibility of the new media designer in the context of Web product development.
- Demonstrate those aspects of interface design and usability that apply to user diversity in product design, including various cultures and users with disabilities.

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### KEY POINTS TO NOTE

- **Rigor:** This course will move along at a quick pace, being organized around a collection of weekly chapter readings and design exercises related to theory and application. Though this course is an introduction to the new media usability discipline, it attempts to become as specific as possible about the major models and concepts of interactive design.
- **Cooperation:** Cooperation with the instructor and teammates is vital for maintaining a high degree of productivity and harmony in weekly assignments and during class time.
- **Flexibility:** Though the instructor will abide by the stated content of this syllabus, there may be some variation with the weekly assignments to accommodate for particular unforeseen circumstances with weekly projects. In the strictest sense, the finer details of the weekly schedule are NOT part of the syllabus.
- **Creativity:** This course demands not only a weekly response to assignments but also some degree of problem solving in product design. The class discussions, lectures and other resources will be used to support the project development and management of the product throughout the semester. This will require a collaborative group effort, i.e. most exercises/projects will be team based (3-4 people per team).
- **Management:** Though each team will experience the design of a Web product, the product design, development, and testing life-cycle are the focal points of this course. This is the dynamic aspect of the course, where students have a chance to develop a product where they can apply much of the theory gained during the weekly assignments. Team management, communication, collaboration, and problem-solving are key activities that must be developed and improved while learning the theories and techniques of Web interface design and testing.
- **Accountability:** Being responsible as adults, either in the classroom or in the real world, has its rewards. In this way course assignments and projects are not merely for learning but also a test of your character whereby diligence and accountability to the assignments and your teammates will be assessed.
- **Deadlines:** ALL deadlines are clearly stated in this Syllabus. The instructor will give reminders of these dates, BUT in the end, each student is responsible for the deadline. In other words, no one can say, “I never knew that was due today.”
- **Communication:** Oral and written communication is an important part of this course. We will have weekly open discussion sessions, small group discussions about reading materials and your projects, projects reports, and a short course paper. The reports provide a way to explain in detail the theoretical and practical aspects of each project. The paper is NOT busy work, but rather a necessary

means for each student to expand their individual knowledge on a subject of their choice related to usability, as well as for the instructor to give more weight to individual accountability.

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## **EXPECTATIONS / GUIDELINES / POLICIES**

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### **Attendance University Policy**

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

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### **Attendance sheet**

The instructor will do a roll-call or an attendance sheet will be passed out in class for each student to sign their name. If you do not sign your name while in class you will be marked absent. The instructor is not expected to remember who attended when, so signing the sheet while in class is important. 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 conduct.

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### **Penalty for Missing Class**

Missing class WILL affect your grade. Students are allowed two absences before their grade will be affected. Missing class means you do not show for the entire evening of class. Particular class days during the last three weeks of the semester are especially crucial to this course. As a result, missing these days will have impact on the students’ regardless how many class times have been missed prior to this time. The grade reduction policy works in this way:

- On the third missed class your final grade will drop 10 points (regardless of the reason).
- On the fourth missed class your final grade will drop 20 points (regardless of the reason).
- On the fifth missed class a grade of “F” will be issued for the course and the student will have the option of dropping the course.

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### **Class Tardiness**

Because evening classes are so lengthy, coming late to class can also affect your grade. Habitual tardiness could reduce your grade at the end of the class under the category of class participation.

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### **Incompletes**

Incompletes will NOT be issued except under very extreme personal conditions that have been reviewed by the instructor and in some cases in consultation with the Dean’s Office.

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### **Responsibility for all materials and 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.

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### **Assignments and Due Dates**

Course assignment deadlines should be adhered to, to insure fairness to all students. For the purpose of maintaining an equal and fair evaluation of each student’s work, no student will receive special treatment. As a result, the following rules will apply to this course: 1) All assignments must be ready to hand in at the designated time and place as stated on the assignment sheet, as discussed in class or communicated via email, or on the syllabus. 2) All assignments handed in late will be reduced 10 points for every day late (24 hrs. from the due date and time).

### **Not-Show for Class to Hand in Your Assignment or Your Team's Assignment**

Not coming to class to hand in an assignment or forgetting to bring the assignment does NOT constitute a valid reason. In other words, if a student has not finished an assignment and decides to not come to class, both the absence will be recorded and a zero grade will be assigned to the project without exception. This arrangement is especially necessary in light of team-based projects in which other teammates are usually dependent on one another to come to class with assignments finished. It is advisable that teammates keep in very close communication about project deadlines and handing in assignments.

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## GRADE BREAKDOWN

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### 70% Team Portion of Grade

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<b>I. REQUIREMENTS ANALYSIS</b>	<b>5%</b>
<ul style="list-style-type: none"><li>• User needs analysis</li><li>• Competitive analysis</li><li>• User/stakeholder analysis</li></ul>	
<b>II. CONCEPTUAL DESIGN</b>	<b>10%</b>
<ul style="list-style-type: none"><li>• Hybrid task analysis: Task hierarchy analysis</li><li>• Card sort technique</li><li>• Old Information architecture analysis</li><li>• New information architecture design</li></ul>	
<b>III. MOCKUPS &amp; PROTOTYPING</b>	<b>10%</b>
<ul style="list-style-type: none"><li>• Interface thumbnail (mini) sketches on paper</li><li>• Using mockup checklist and schedule</li><li>• Interface rapid prototypes on paper</li><li>• Using mockup style review form</li></ul>	
<b>IV. PRODUCTION</b>	<b>15%</b>
<ul style="list-style-type: none"><li>• Preparing and editing site content, text and graphics</li><li>• Use writing checklist</li><li>• Executing dynamic prototype of web site</li><li>• Launching site on time and complete</li></ul>	
<b>V. USABILITY TESTING &amp; EVALUATION</b>	<b>20%</b>
<ul style="list-style-type: none"><li>• Heuristic Inspection</li><li>• Usability testing and taping (Think-Aloud Technique)</li><li>• User profiling questionnaire</li><li>• Product questionnaire</li><li>• Test script and use of all other worksheets and forms</li><li>• Post test interview session</li><li>• Focus group session</li><li>• General data gathering and analysis</li></ul>	
<b>VI. FINAL REPORT</b>	<b>10%</b>
<ul style="list-style-type: none"><li>○ Final analysis of data and making recommendations</li></ul>	

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### 30% Individual Portion of Grade

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<b>Final Paper on Usability</b>	<b>10%</b>
<b>Team Member Assessment:</b> (Attendance, Attitude, Cooperation, etc.)	<b>5%</b>
<b>Class participation &amp; Quiz / Test Scores *</b>	<b>15%</b>

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#### \*Participation and engagement observed during class time:

- Quiz and/or Test scores (50% of participation, if applicable.)
- Responsive and knowledgeable of text material for open discussions
- Evidence of preparation for team and class discussions.

- Evidence of preparation for team projects and report development.
- Class attendance and promptness to class time.
- Attitude and investment in course as a whole.

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## BASIC GRADE BREAKDOWN

A+	(98-100%)	=	Professional level work, showing highest level of achievement
A	(93 - 97%)	=	Extraordinarily high achievement, quality of work; shows command of the subject matter
A-	(90 - 92%)	=	Excellent and thorough knowledge of the subject matter.
B+	(88 - 89%)	=	Significantly above average understanding of material and professional quality of work.
B	(84 - 87%)	=	Signifies mastery and fulfillment of all course requirements; very good and quality work.
B-	(80 - 83%)	=	Good, acceptable work.
C+	(78 - 79%)	=	Satisfactory quality of work.
C	(74 - 77%)	=	Minimally acceptable performance and quality of work; partial mastery.
C-	(70 - 73%)	=	Unacceptable work, does not demonstrate mastery.
D+	(68 - 69%)	=	Completely unacceptable work.
D	(64 - 67%)	=	Absolutely unacceptable work.
D-	(60 - 63%)	=	Absolutely unacceptable work and just above failure.
F	(Below 60%)	=	Failed.

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## GRADING PRINCIPLES

**EVALUATION FORMS:** Students should review all grading forms that will be used by the instructor to grade projects, presentations, papers, and other assignments, as well as the forms used by teams to assess one another. Please see the course web site under the section called “Evaluation Forms.” These documents will show you the checklist and criteria by which each class assignment will be evaluated.

**MINI-ASSIGNMENT CHECKING:** By reviewing the grade breakdown above, you can see that the majority of the grade is based on the team project. The team project has a range of stages at which you will be graded. However, from one stage to another there are weekly mini-assignments that build up to the completion of a particular stage. Each week you will receive a sheet that will indicate the following week’s deliverables, which will be composed of mini-assignments. This sheet will indicate precisely what is due, when. Although these mini-assignments will not be graded, they must be completed weekly as the assignment sheet stipulates. Points will be deducted from your final project grade if the mini-assignments are not done according to the assignment sheets.

# PROJECT ROADMAP

**NOTE:**

**THIS WEEK-BY-WEEK SCHEDULE IS ONLY A GENERAL ROADMAP.**

You **MUST** read the weekly Deliverable Sheets for Detailed Instructions of Weekly Reading, Project Assignments and Due Dates.

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## **DAY 1 OF CLASS (*Introduction to Course*)**

**Week 1**

- A. Review syllabus
- B. Fill out forms
- C. Form teams
- D. Cover goals
- E. Form web usability teams

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## **INTRO - PERVASIVE USABILITY (*Introduction to Usability*)**

**Week 2**

### **A. CLASS DISCUSSION**

- TOPIC: Usability throughout the Design Process

### **B. PROJECT**

- Nothing for this week.

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## **I. REQUIREMENTS ANALYSIS (*Pre-Design Stage*)**

**Week 3**

### **A. CLASS DISCUSSION**

- TOPIC: Task Analysis

### **B. PROJECT** [Hand in at start of class.]

- Step 1 - Identify project goals and the competition
- Step 2 – Identify the stakeholders, business goals, user goals, usability objectives

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## **II. CONCEPTUAL DESIGN – Part 1 (*Design Stage*)**

**Week 4**

### **A. CLASS DISCUSSION**

- TOPIC: Information Architecture

### **B. PROJECT**

- Step 1 – Review the data from the Requirements Analysis stage (I. B. Step 1& 2)
- Step 2 – Do a Hybrid Task Analysis
- Type your findings out according to the three major steps and sub-steps., e.g.

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## **II. CONCEPTUAL DESIGN – Part 2 (*Design Stage*)**

**Week 5**

### **A. CLASS DISCUSSION**

- TOPIC: Prototyping

### **B. PROJECT**

- Step 1 – Review and diagram (sketch) the structure of OLD Web site architecture
- Step 2 – Do Card Sort Technique
- Step 3 – Create new site architecture
- Step 4 – Review Information Architecture checklist
- Step 5 - Prepare short summary

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## **III. MOCKUPS & PROTOTYPING (*Design Stage – Part 1*)**

**Week 6**

### **A. CLASS DISCUSSION**

- TOPIC: Envisioning Design

### **B. PROJECT**

- Step 1 – Thumbnails sketches of Home Page

- Step 2 – Select the pages to prototype

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**III. MOCKUPS & PROTOTYPING (*Design Stage – Part 2*)** **Week 7**

**A. CLASS DISCUSSION**

- TOPICS: Web Content Development

**B. PROJECT**

- Step 1 – Rapid prototypes – Refined prototype

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**IV. PRODUCTION (*Design Stage – Part 3*)** **Week 8**

**A. CLASS DISCUSSION**

- TOPICS: Design Elements & Usability Software

**B. PROJECT**

- Step 1 – Writing for the Web (Content Development)
- Step 2 – How do people read
- Step 3 – Begin building components to Web site

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**IV. PRODUCTION (*Design Stage – Part 4*)** **Week 9**

**A. CLASS DISCUSSION**

- TOPICS: Quality assurance testing

**B. PROJECT**

- Step 1 – Design Elements
- Step 2 – Usability in Software Development
- Step 3 - Engineering Web Site Components

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**V. LAUNCH (*Post-Design Stage – Part 1*)** **Week 10**

**A. CLASS DISCUSSION**

- TOPICS: Ten Web Guidelines & User Testing

**B. PROJECT**

- Step 1 – Do QA testing
- Step 2 – Final Hurdles

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**VI. USABILITY EVALUATION (*Post-Design Stage – Part 2*)** **Week 11**

**A. CLASS DISCUSSION**

- TOPICS: Focus groups and interviews

**B. PROJECT**

- Step 1 – Usability Inspection

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**VI. USABILITY EVALUATION (*Post-Design Stage – Part 3*)** **Week 12**

**A. CLASS DISCUSSION**

- NO READING

**B. PROJECT**

- Step 1 – Fill out worksheet, Form 12-2, p. 424-425
- Step 2 – Execute the test
- Step 3 – **USE** Post (task) questionnaire and demographics sheet

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**VI. USABILITY EVALUATION (*Post-Design Stage – Part 4*)** **Week 13**

**A. CLASS DISCUSSION**

- NO READING

**B. PROJECT**

- Step 1 – Continue to carry out previous week’s assignment.
- Step 2 – Discuss results of test (Do outside of class during the week)
- Step 3 – Team gathers to discuss data and prepares questions for the focus group
- Step 4 – Carry out the focus group with all the test subjects (Use online Form 3-4)
- Step 5 – Getting started on the report

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**THANKSGIVING BREAK** **Week 14**

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**VIII. EXTRA WEEK TO DEVELOP PRODUCT** **Week 15**

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**VIII. PROJECT PRESENTATION TO THE CLASS** **Week 16**

- Step 1 – Gather all the test materials and data results
- Step 2 – Analyze data and make recommendations
- Step 3 – Prepare Final PowerPoint Presentation

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**IX. DUE: PROJECT REPORT FINAL PAPER** **Week 17**

- Step 1 – Review report template prepared online
- Step 2 – Write the final report and paper
- Step 2 – Team approval, have all team members sign off on final report before handing in.
- Step 3 - Deliver to instructor’s office.
  - Hand in Final Report and revised web site on CD.
- **LATE REPORTS AND PROJECTS WILL NOT BE ACCEPTED!!!**

# Project Introduction & Project Map

## TEAM PROJECT

1. Web design and usability teams will be constructed based on student interests, skills, and knowledge backgrounds. Background in software, graphic design, psychology, technology, and marketing/advertising skill-sets will also be considered.
2. Once formed they can give themselves a company name. Teams are formed to create a real-world scenario that is directed at design and testing a mock web site. Each team should function as a small usability problem-solving group as they travel through the lifecycle of a product.
3. Once the teams have been formed, they will carry out a specific range of project tasks, which will include the analysis, design, inspection, testing, and reporting on their usability project.
4. Members will bring their materials together for discussion, evaluation, and selection of the best solutions to the usability problems, stage-by-stage.
5. During the first team meeting, members should discuss time management, communication issues, instructions of the project, and the basic roles and responsibilities of each person. At the end of the semester, each team member will have the opportunity to evaluate the other members' contribution to the team effort. Those who did not collaborate well will receive the poorest evaluation by their teammates.

## STAKEHOLDERS IN THE DESIGN PROCESS

During the semester, the text and class discussions will refer to the stakeholders as a broad group of people, including primarily: the client, the users, and the design team.

1. The client is the organization that has hired your team to redesign their site. The client is fictitious. When filling out forms you can merely indicate what you think might be a realistic response to client-related questions and interests.
2. The users or target audience will be another team that will serve as your users in the testing process. They will fill out the user profile questionnaires and be your subjects in the testing process.
3. The design team is obviously one of the teams that are formed at the start of class.

## COMMUNICATION

1. The two most important aspects of team coordination are communication and flexibility. Members should give one another their email addresses (phone numbers with permission) to maximize communication.
2. Throughout the semester there should be regular communication by email or phone, between team members while completing the out-of-class assignments. ALL team members should strive NOT to isolate or ignore any other team member(s), but should attempt to make an extra effort to communicate, even if their response is lacking.
3. On the other hand, team members who are lax or irresponsible in their role should expect a reduced grade at the end of the semester.

## WEB CONTENT SOURCE

1. Once your team has agreed upon a site for re-design, you will remove the content to construct the re-designed site. In reality, this means, all the current content that is on the old

site will be stripped out and re-purposed.

2. Your team can copy and paste the current material from the site and reconsider all aspects of revising and replacing current text, images, layout, navigation, databases, etc. This is why it is important that the site under evaluation be rather small in scope.

### **COPYRIGHT**

1. The context of this project is educational and the content and site design used should be repurposed to the point that there is no recognizable similarity to the pre-existing site. This should protect you from any copyright infringements.
2. Also, it is advisable not to contact the original owners of the site selected, because of misunderstanding and concern that their site might be used for purposes not under their control.
3. Once you construct your Web site and put it on line, you should type somewhere on the site in small print, "For Educational use ONLY." This will further protect you from the owners of the original site from becoming a problem.

### **PROJECT MAP OVERVIEW**

In this class you will be part of a Usability Consulting Team where you will research, design, and test an online Web product. This project consists of 7 major stages, as listed below. Stages 1-6 revolve around the usability theory and practice in the course textbook, with some additional materials supplied by the instructor that are not covered in the text.

