

## Fall 2016: ITI 230: Human-Computer Interaction

[http://comminfo.rutgers.edu/~chirags/teaching/2016\\_fall/ITI230/](http://comminfo.rutgers.edu/~chirags/teaching/2016_fall/ITI230/)

**Class meetings:** Monday & Wednesday, 7:40-9:00pm, [Academic Building](#)-4400.

**Instructor:** [Dr. Chirag Shah](#)

**Email:** [chirags@rutgers.edu](mailto:chirags@rutgers.edu)

**Phone:** (848) 932-8807

**Office:** Room 302 in [SC&I](#)

**Office hours:** Monday and Wednesday 1-2pm, or by appointment

**Teaching Assistant:** Yiwei Wang

**Email:** [yw498@scarletmail.rutgers.edu](mailto:yw498@scarletmail.rutgers.edu)

**Phone:** (848) 932-8763

**Office:** Room 303 in [SC&I](#)

**Office hours:** TBD, or by appointment

### Course Description

This course studies how best to design the interface between human users and computer systems. Emphasis is placed on learning how to involve the user at different stages in the design process to improve the interface in a cost effective way. In particular, experience with iterative user-centered design, rapid prototyping and usability testing methods are developed. Students evaluate several computer interfaces as well as iteratively design and evaluate an interface prototype.

### What is this Course About?

This course provides an overview about the user interface design. The course particularly concentrates on the user interface design for information retrieval systems, based on human information seeking behavior. The user interface lies between the user and the information system. It is designed to facilitate user-system interaction. Information searching is a highly complex and intelligent task. Given the explosion of digital information available for search, information retrieval systems need more effective, efficient, and natural user interfaces to support access to information.

The course will cover basic concepts in human-computer interaction, user interface design principles, task and user analysis, interface design methods, user interface evaluation and usability testing. Students will be expected to do readings, participate in discussion, and complete all assignments. They will extensively use web design tools to prototype user interfaces. For further information about the topics covered in this class, please see the class topics and schedule.

This is NOT a course on programming, app development, or Web page design. The course requires a basic understanding of information \*systems\* and hands-on skills with the use of prototyping tools.

### Prerequisites

01-198:113 OR 198:211 OR 04-547:202

## Course Materials

### Required:

- *Main text:* UIDE: Stone, D., Jarrett, C., Woodroffe, M. & Minocha, S. (2005). User Interface Design and Evaluation. Morgan Kaufman. ISBN 978-0-12-088436-0. [[companion website](#) - contains most early chapters 1-10 in PDF] [You can get a used/new copy at [Amazon](#) for less than \$15.]
- *Secondary text:* SM: Studio 7.5. (2005) Designing for Small Screens (Required Reading Range, Ava books) (Paperback) by Studio 7.5 (Author) ISBN-10: 2940373078. [You can get a cheap used copy at [Amazon](#) for less than \$5.]
- ET: Norman, D. (1988). The Psychology of Everyday Things. New York : Basic Books. Also published under "The Design of Everyday Things" Call number TS171.4.N67 1988. [Chapters 1, 2, 3 & 4 - Full -text available on [Sakai](#)]. [You can get a cheap used copy at [Amazon](#) for under \$5; and pay approx. \$10 for a new copy. Full-text is also available on-line through [questia.com](#)]
- UE: Rosson, M.B & Carroll, J.M. (2002). Usability engineering: scenario-based development of human-computer interaction. Morgan Kaufman. [QA76.9.H85R67 2002] Chapter 4/5 only - Full-text available [go to Resources on [Sakai](#)]. [If you happen to have access to books24x7.com this book is [on-line](#)]

### Recommended:

- UCD: Norman, D.A., Draper, S.W. (Editors) (1986). User centered system design: new perspectives on human-computer interaction. Mahwah, NJ, Lawrence Erlbaum Associates. [Q76.9.I58U73 1986] Chapter 3 only - Full-text available [go to Resources on [Sakai](#)].
- TCUID: Lewis, C. and Rieman, J. (1993) Task-Centered User Interface Design: A Practical Introduction. Entire book available on-line as shareware <http://hcibib.org/tcuid/>
- HF: Vicente, K. (2003). The Human Factor: Revolutionizing the Way People Live With Technology. Knopf Canada . In particular, chapters 1,2,4 & 5. [303.4834 V632H]

## Learning Objectives

By the end of the course, students should be able to:

- Describe relevant HCI theories;
- Identify the strengths and weaknesses of interface designs and provide suggestions of how to improve them;
- Design interfaces to accommodate a wide range of users and skill levels;
- Undertake iterative and inexpensive user-centered design methods;
- Perform usability testing procedures;
- Apply practical design methodology to develop an interface prototype, based on market research, task analysis and user input.

## Instructional Methods

The course combines lectures, discussions, demonstrations, and assignments/projects to help students understand UI design principles, task and user analysis, design methods, and UI evaluation and usability testing techniques in developing interactive information systems. Students are encouraged to discuss, question, and clarify course content in class meetings.

The assignments are individual and group work. The assignments reflect a process and each one builds on the results of the previous. All focus on conceiving, developing, and testing an interface to information content, and will follow the material discussed in class.

## Topics

- Design requirements gathering
- Identifying requirements using scenarios and task analysis
- Conceptual design and prototyping
- Design of mobile UIs
- Designing and prototyping mobile apps
- Developing mobile apps
- Information design
- Layout and use of color
- Evaluating user interfaces

## Course Assessment

The content of this course is best understood by assimilating the lectures, by readings, by analyzing examples and by practice. The assessment for this course is based on a series of assignments that match the real-world process and on class participation. Assignments are of two types: smaller exercises and a multi-part course project. Descriptions of the assignments are available on the course website. There will also be exercises that are not graded - in all cases, you will later use the same techniques/methods as a part of your project. Class participation includes participation in discussions; reading descriptions. Course grades are assigned according to the following:

- **A** (91-100%): **Outstanding and excellent work** of the highest standard, mastery of the topic, evidence of clear thinking, good writing, work submitted on time, well organized and polished.
- **B+** (85-90%): **Very good work**, substantially better than the minimum standard, very good knowledge of the topic; error free.
- **B** (80-84%): **Good work**, better than the minimum standard, good knowledge of the topic.
- **C+** (74-79%): **Minimum standard work**, adequate knowledge of the topic.
- **C** (70-73%): Work barely meeting the minimum standard, barely adequate knowledge of the topic; errors.
- **D** (65-69%) Writing not up to standard, disorganized, many errors
- **F** (< 65%): Unacceptable, inadequate work
- **T**: Temporary.

The final grade will be weighted based on the following: Assignments: 25%, Quizzes: 25%, Project: 45%, Class participation: 5%.

## Course Policies

**Announcements:** Students are responsible for all announcements made in class, whether or not they are present when the announcements are made.

**Late submissions:** Deadlines are your responsibility. Late submissions may be accepted with a penalty. In the case of unforeseen emergencies (e.g. with a doctor's note), or with a prior permission from the instructor (obtained before the due date), late submissions will be graded normally. Late submissions will not receive any verbal or written feedback.

**Communication:** For emails, Rutgers accounts preferred. Always include your name (esp. if emailing from non-Rutgers account) and always include the course number (ITI 230) in subject line. If you don't, your email most likely will not be read. This course uses [Sakai](#), primarily for submitting assignments and posting grades. Speaking of communication, please turn off or silent your cellphones and anything that can spontaneously make noise before entering the class. Please do not text nor view text messages during class. Please do not use computers to check e-mail, IM, surf the web, and other such activities. This is distracting for other students and there have been student complaints about this. If you are caught using a cell phone or other communication you will receive one warning, on the second occurrence you will be excused from classroom.

**Attendance:** Students are expected to attend all classes. If you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me. Note that class participation accounts for 5% of the final grade (see the grading policy above). You are responsible for obtaining any material that might have been distributed in class the day when you were absent.

## Academic Integrity

Academic integrity means, among other things:

- Develop and write all of your own assignments.
- Show in detail where the materials you use in your papers come from. Create citations whether you are paraphrasing authors or quoting them directly. Be sure always to show source and page number within the assignment and include a bibliography in the back.
- Do not look over at the exams of others or use electronic equipment such as cell phones or MP3 players during exams.
- Do not fabricate information or citations in your work.
- Do not facilitate academic dishonesty for another student by allowing your own work to be submitted by others.

If you are doubtful about any issue related to plagiarism or scholastic dishonesty, please discuss it with the instructor. At the instructor's discretion, work presented in this course is subject to verification of originality, using [www.turnitin.com](http://www.turnitin.com).

The consequences of scholastic dishonesty are very serious. Rutgers' academic integrity policy is at <http://ctaar.rutgers.edu/integrity/policy.html>. An overview of this policy may be found at <http://academicintegrity.rutgers.edu/resources-for-students>. Multimedia presentations about academic integrity may be found at <http://www.scc.rutgers.edu/douglass/sal/plagiarism/intro.html>.

## How to Succeed in this Course

- Successful students will attend class regularly. If you know you must miss a class, please contact the instructor in advance, either by phone or email. You can obtain assignments or notes from a fellow classmate or from the instructor. In the case of a prolonged absence from class, you should schedule an appointment with the instructor so we can discuss the course material and concepts that you missed.
- Successful students will pay close attention to the course goals and objectives, because they will help you master the course material. If you have any questions about any of the objectives, please ask the instructor. Questions are encouraged during class for clarification. Remember that you're probably not the only one in the class with the same question. If you have questions about material from previous classes, please email me prior to the next class session, and I'll address your question at the beginning of the class session, prior to any quizzes.
- Successful students will talk to their classmates about the course material. You will find that they can help you understand many complex issues.
- Successful students will come prepared to the class with assigned readings for that class. This will help you comprehend the material for that class better. Regular assignments will also be given at the end of each class. Doing these assignments and turning them on time (typically before the next class), will help you obtain higher-order learning goals for this course.

## Professionalism

1. Access the class material promptly and on time.
2. Respect yourself, classmates, and the instructor.
3. Participate in class discussions.
4. Display preparedness for class through completing reading assignments.
5. Present content knowledgeably with supported reasoning.

## Schedule

#	Day	Topics and Activities	Readings	Assignment/Quiz
1.	Wed, Sept. 7	<ul style="list-style-type: none"> <li>• Introduction to the course</li> <li>• Administrivia</li> <li>• HCI and UCD</li> </ul>		<ul style="list-style-type: none"> <li>• Quiz-0</li> </ul>
2.	Mon, Sept. 12	<ul style="list-style-type: none"> <li>• Interaction and Design Principles</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 1</li> </ul>	
3.	Wed, Sept. 14	<ul style="list-style-type: none"> <li>• Understanding users - Requirements gathering</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 2, 10.2</li> <li>• ET Ch 1, 2</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment-1</li> </ul>
4.	Mon, Sept. 19	<ul style="list-style-type: none"> <li>• Understanding users - Identifying requirements: scenarios &amp; task analysis</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 3</li> <li>• TCUID Ch 2</li> </ul>	
5.	Wed, Sept. 21	<ul style="list-style-type: none"> <li>• Understanding users - Identifying requirements: tasks and work</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 4</li> </ul>	
6.	Mon, Sept. 26	<ul style="list-style-type: none"> <li>• Understanding users - Representing requirements</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 5</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz-1</li> </ul>
7.	Wed, Sept. 28	<ul style="list-style-type: none"> <li>• <i>Review of task analysis and requirements gathering</i></li> </ul>		<ul style="list-style-type: none"> <li>• Assignment-2</li> </ul>
8.	Mon, Oct. 3	<ul style="list-style-type: none"> <li>• Understanding users - Mental Models</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 4.1.3, 10.3</li> <li>• ET Ch 3, 4</li> </ul>	
9.	Wed, Oct. 5	<ul style="list-style-type: none"> <li>• Conceptual Design &amp; Prototyping: from requirements to design</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 8</li> <li>• TCUID Ch 3</li> </ul>	
10.	Mon, Oct. 10	<ul style="list-style-type: none"> <li>• Practice: Prototyping &amp; Developing Apps (App Inventor)</li> </ul>		<ul style="list-style-type: none"> <li>• Quiz-2</li> </ul>
11.	Wed, Oct. 12	<ul style="list-style-type: none"> <li>• Conceptual Design and Prototyping - Lo-fi</li> </ul>	<ul style="list-style-type: none"> <li>• TCUID Ch 3</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment-3</li> <li>• <a href="#">Project stage#1</a></li> </ul>
--	Mon, Oct. 17	<i>No class - instructor away</i>		

--	Wed, Oct. 19	<i>No class - instructor away</i>		<ul style="list-style-type: none"> <li>• <a href="#">Project stage#2</a></li> </ul>
12.	Mon, Oct. 24	<ul style="list-style-type: none"> <li>• Practice: Paper Prototyping &amp; Developing Apps (App Inventor)</li> </ul>		
13.	Wed, Oct. 26	<ul style="list-style-type: none"> <li>• Conceptual Design and Prototyping - Hi-fi</li> </ul>		<ul style="list-style-type: none"> <li>• Assignment-4</li> </ul>
14.	Mon, Oct. 31	<ul style="list-style-type: none"> <li>• Practice: MapTour tutorial (App Inventor)</li> </ul>		<ul style="list-style-type: none"> <li>• Quiz-3</li> </ul>
15.	Wed, Nov. 2	<ul style="list-style-type: none"> <li>• Physical Design: Design guidelines and interaction styles</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 10, 11</li> </ul>	
16.	Mon, Nov. 7	<ul style="list-style-type: none"> <li>• Practice: Group work on your lo-fi (paper) prototypes</li> </ul>		<ul style="list-style-type: none"> <li>• <a href="#">Project stage#3</a></li> </ul>
17.	Wed, Nov. 9	<ul style="list-style-type: none"> <li>• Interaction styles</li> <li>• Mobile UI design</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 18</li> <li>• SM Ch 2</li> </ul>	
18.	Mon, Nov. 14	<ul style="list-style-type: none"> <li>• Class presentations - Prototypes</li> </ul>		<ul style="list-style-type: none"> <li>• Quiz-4</li> </ul>
19.	Wed, Nov. 16	<ul style="list-style-type: none"> <li>• Evaluating User Interfaces with experts</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 20, 21, 26</li> <li>• TCUID Ch 4</li> </ul>	<ul style="list-style-type: none"> <li>• Assignment-5</li> </ul>
20.	Mon, Nov. 21	<ul style="list-style-type: none"> <li>• Evaluating User Interfaces with users</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 22-25</li> <li>• TCUID Ch 5</li> </ul>	
--	Wed, Nov. 23	<i>No class - Friday schedule</i>		
21.	Mon, Nov. 28	<ul style="list-style-type: none"> <li>• Visit of User Interaction Lab in SC&amp;I</li> </ul>		<ul style="list-style-type: none"> <li>• Assignment-6</li> </ul>
22.	Wed, Nov. 30	<ul style="list-style-type: none"> <li>• Information design, Color in UI</li> </ul>	<ul style="list-style-type: none"> <li>• UIDE Ch 13, 14</li> <li>• SM Ch 8</li> </ul>	<ul style="list-style-type: none"> <li>• Quiz-5</li> <li>• <a href="#">Project stage#4</a></li> </ul>
23.	Mon, Dec. 5	<ul style="list-style-type: none"> <li>• Practice: App Inventor - group work</li> <li>• Informal presentation of your apps</li> </ul>		

24.	Wed, Dec. 7	<ul style="list-style-type: none"> <li>• Heuristic evaluation of your apps (project work)</li> </ul>		<ul style="list-style-type: none"> <li>• <a href="#">Project stage#5</a></li> </ul>
25.	Mon, Dec. 12	<ul style="list-style-type: none"> <li>• <i>Course review</i></li> </ul>		<ul style="list-style-type: none"> <li>• Quiz-6</li> </ul>
26.	Wed, Dec. 14	<ul style="list-style-type: none"> <li>• <b>Final project presentations</b></li> </ul>		<ul style="list-style-type: none"> <li>• <a href="#">Project stage#6</a></li> </ul>

## Project

For the class project, each student will participate in a group project, which is worth 45% of the course grade. Following is the step-by-step stages for doing the project. Detailed instructions for each stage will be available from [Sakai](#).

Stage	Task	Weight	Due
1	Project proposal	2%	Oct. 12
2	Understanding users: User Needs & Tasks	5%	Oct. 19
3	Lo-Fi Prototype & Informal Evaluation	5%	Nov. 7
4	Hi-Fi Prototype	10%	Nov. 30
5	Heuristic Evaluation	5%	Dec. 7
6	Final Project Presentation (poster)	5%	Dec. 14
7	Final Project Report	13%	Dec. 16

## **Student-Wellness Services**

### **Counseling, ADAP & Psychiatric Services (CAPS)**

**(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901**

<http://rhscaps.rutgers.edu/>

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

### **Violence Prevention & Victim Assistance (VPVA)**

**(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901**

<http://vpva.rutgers.edu>

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

### **Disability Services**

**(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854**

<https://ods.rutgers.edu>

The Office of Disability Services works with students with a documented disability to determine the eligibility of reasonable accommodations, facilitates and coordinates those accommodations when applicable, and lastly engages with the Rutgers community at large to provide and connect students to appropriate resources.

### **Scarlet Listeners**

**(732) 247-5555 /**

<http://www.scarletlisteners.com>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

["Just In Case" Web App](#)

<http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

## Class Attendance/Participation Rubric

Criteria	Unsatisfactory-Beginning	Developing	Accomplished	Exemplary	Total
<b>Attendance</b>	<b>0-16 points</b>	<b>17-19 points</b>	<b>20-22 points</b>	<b>23-25 points</b>	<b>/25</b>
	3 or more unexcused absences	2 unexcused absences	1 unexcused absence	Attended all class sessions or received approval for all necessary absences	
<b>Frequency</b>	<b>0-16 points</b>	<b>17-19 points</b>	<b>20-22 points</b>	<b>23-25 points</b>	<b>/25</b>
	Student does not initiate contribution & needs instructor to solicit input.	Student initiates contribution at least in half of the class sessions	Student initiates contribution once in each recitation.	Student initiates contributions more than once in each class session.	
<b>Quality</b>	<b>0-16 points</b>	<b>17-19 points</b>	<b>20-22 points</b>	<b>23-25 points</b>	<b>/25</b>
	Comments are uninformative, lacking in appropriate terminology. Heavy reliance on opinion & personal taste, e.g., "I love it", "I hate it", "It's bad" etc.	Comments are sometimes constructive, with occasional signs of insight. Student does not use appropriate terminology; comments not always relevant to the discussion.	Comments mostly insightful & constructive; mostly uses appropriate terminology. Occasionally comments are too general or not relevant to the discussion.	Comments always insightful & constructive; uses appropriate terminology. Comments balanced between general impressions, opinions & specific, thoughtful criticisms or contributions.	
<b>Listening</b>	<b>0-16 points</b>	<b>17-19 points</b>	<b>20-22 points</b>	<b>23-25 points</b>	<b>/25</b>
	Does not listen to others; regularly talks while others speak or does not pay attention while others speak; detracts from discussion; sleeps, etc.	Student is often inattentive and needs reminder of focus of class. Occasionally makes disruptive comments while others are speaking.	Student is mostly attentive when others present ideas, materials, as indicated by comments that reflect & build on others' remarks.	Student listens attentively when others present materials, perspectives, as indicated by comments that build on others' remarks, i.e., student hears what others say & contributes to the dialogue.	
				<b>TOTAL</b>	<b>/100</b>

## Resources

### Internet Resources

[hcibib.org](http://hcibib.org) - The most comprehensive HCI resource

[www.usableweb.com](http://www.usableweb.com) - A collection of links about human factors, user interface design for the web

[www.useit.com](http://www.useit.com) - Jacob Nielsen's website

[www.asktog.com](http://www.asktog.com) - Bruce Tognazzini's website

[Android resources](#) - compiled by Prof. Gwizdka

### Web Accessibility

[Web Accessibility Initiative \(WAI\)](#)

[Designing more usable websites](#) (U of Wisconsin-Madison)

### ACM SIGCHI

[ACM SIGCHI homepage](#)

[Interactions](#) - ACM SIGCHI bi-monthly magazine

[List of ACM SIGCHI publications](#)

### App Development

[App Inventor Beta 2](#)

[Installing and running the emulator for App Inventor](#)

[App Inventor tutorials](#)

### Past Student Projects

[Student spending calculator app](#)

[Emergency message app](#)

[Task management app](#)

[Homework tracker app](#)