# CEN 4721 Human-Computer Interaction

Course Syllabus, last revised 8/27/2020

## Course Logistics

**Meeting Times:**
- Tuesday Period 8 – 9 (3:00pm – 4:55pm)
- Thursday Period 9 (4:05pm – 4:55pm)

**Meeting Location:**
- Online via Zoom. Link available through available through https://elearning.ufl.edu/

## Instructor Information

**Instructor:** Eric Ragan, PhD
- E-mail address: eragan@ufl.edu (put "HCI class" in the subject)
- Office location: Online

**TA:** Shae Esmaeili
- E-mail address: esmaeili@ufl.edu (put "HCI class" in the subject)
- Office location: Online

**Office hours:**
- Online meetings are possible during scheduled class times (after lecture or project events) or by appointment.
- As an online class, physical in-person office hours are not available.

**Class web site:** Available through https://elearning.ufl.edu/

## Course Information

### Catalog Description
A study of the major topics in human-computer interaction, including interface design (principles, theories), software tools, virtual environments, interactive devices, collaboration, and visualization.

What is this course, and who is it for?
This course is directed towards **junior and senior** undergraduate students who wish to learn the basic concepts and current research into the design, creation, and evaluation of computer interfaces. This is a research-centric course. While the course requires substantial technical development, the emphasis is on the design, analysis, and evaluation of human-centered interfaces in accordance with common methodologies.

Upon completion of this course, students will be able to:
- Characterize and critique core concepts and methods of human-computer interaction
- Design and build human-computer interfaces
- Evaluate human-computer interfaces
- Analyze projects, systems, and designs based on human needs and task requirements

### Programming Tools and Languages
You can use any development environment and programming language appropriate for class assignments or project works. This class involves group assignments, and individual requirements will vary based on team interests and abilities. Students are expected to be able to independently learn the appropriate

technology or development skills as needed for their projects.

**Programming Requirements**
Students should be confident and experienced with independently learning new tools or programming libraries. Programming at a Data Structures level is required. You will be required to implement an interactive system.

**Pre-requisites and Co-requisites**
COP 3530 Data Structures with minimum grade of C.

**Privacy**
Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

The course may also require the use of proctoring software (e.g., ProctorU, Honorlock) for online exams or assignments. If required, students will need to use a camera and install software on their computers. For more information about privacy with Honorlock, please see:
https://www.it.eng.ufl.edu/2020/03/addressing-honorlock-privacy-and-security-concerns/

**Course Components:**
This course involves the following activities:
- **Lectures**: Core HCI topics will be presented and discussed.
- **Reading**: Textbook and supplemental reading assignments on many HCI topics.
- **Homework**: Frequent homework assignments to practice and reinforce core concepts.
- **Projects**: Create and evaluate human-computer interfaces using common research methods.
- **Exams:** Quizzes or exams on course topics.

**Workload**
The course requires an average to above-average time commitment.

# Course Materials

**Material and Supply Fees:** *None*

**Required Textbooks and Software:**

**Required:** The Human-Computer Interaction Handbook, Fundamentals, Evolving Technologies, and Emerging Applications. Edited by Julie A. Jacko. Third edition.
*Available through the UF library website.

**Recommended (optional):** Design of Everyday Things, Donald Norman

**Resources:** This course will use the Canvas e-Learning course management system to post grades and to communicate with class members. If you have a question about the course that other students could benefit from hearing the answer, please post to the appropriate discussion thread on Canvas rather than sending individual emails to the instructor/TA. Selected readings and content will be assigned from the textbook ("T*he Human-Computer Interaction Handbook",* Jacko), videos, and other reading that will be provided by the instructor via the e-Learning Canvas.

**Required Reading:** Required reading assignments will be given from articles and research papers that are available through the university's digital library subscriptions.

**Required Technology:** As an online course, a **reliable Internet connection** is expected. A **microphone** is needed for voice interactions in the class and to participate in required class activities. Certain course activities (e.g., exams) may require proctoring or honor verification using support software such as Honorock, ProctorU, or Respondus LockDown**.** A **web cam** is required and expected for software (Honorlock, ProctorU) to allow remote exams, and students **may be required to install software** on their own computers to in order to complete mandatory course components.

# Course Communication

Please regularly check the Announcements section of Canvas for any announcements related to the class. Announcements will also be given at the beginning of the class period. Sensitive questions/comments should be emailed to the instructor (not using the Canvas Messaging client), including "HCI" at the start of the subject line. If there are general questions (related to a certain concept) please post them in the "Discussions" section of the Course Website. All members of the class are expected to follow the rules of common courtesy in all email messages, threaded discussions, and chats. Any discourteous conduct will result in a loss of all class quiz points. Please familiarize yourself with the content located at the following link.
http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

# Grading Policy

Course grades will be calculated based on a combination of weighted scores for work in different categories. The final grade (after applying weights) will be truncated to the nearest whole number to determine the letter grade.

| Percent | Grade |
|---------|-------|
| 93 - 100 | A |
| 90 - 92 | A- |
| 88 - 89 | B+ |
| 83 – 87 | B |
| 80 – 82 | B- |
| 78 - 79 | C+ |
| 73 – 77 | C |
| 70 – 72 | C- |
| 68 – 69 | D+ |
| 63 - 67 | D |
| 60 - 62 | D- |
| 0 - 59 | E |

| Evaluation Weights | |
|--------------------|------|
| Projects: | 40% |
| Assignments: | 40% |
| Exams: | 19% |
| Research awareness: | 1% |

## Projects (40% of final grade)

Students will work to complete two projects involving the design, development, and evaluation of human-computer applications. Each project typically expects multiple weeks of work and may require multiple submissions of work. Students will implement an application and conduct user studies to collect data about the application. Students are also required to participate in study sessions of other students. More details on project expectations will be given over the course.

## Assignments (40% of final grade)

In contrast to projects, assignments are smaller stand-alone activities that typically consist of exercises or concept quizzes. Assignment types vary and will be described as the course progresses. Assignments may include synchronous activities (during class time) as well as on-your-own work. Assignment deadlines will be confirmed when individual assignments are posted. Submissions must be made before the given deadline to be eligible for full credit.

## Exams (19% of final grade)

Two exams are scheduled for this course. The exam format typically involves a given set of questions (e.g., multiple choice and free response) in a timed completion period, but alternative formats may be considered (e.g., reading analysis, design exercises, take-home questions). The exam format will be announced prior to the exam date. The instructor may choose to adjust the number of exams with prior announcement to the class.

## Research awareness (1% of final grade)

This course encourages participation in research in human-computer interaction to promote awareness and education of different active research projects involving human and technology at the University of Florida. Students can participate in an approved UF research study (> 0 credits) related or relevant to human-computer interaction to receive credit for the research participation component of the grade. Students may participate in an additional study (1 credit minimum) for an additional 1%.

Participation must be completed during the semester, and only approved studies registered through the CISE Department's SONA system (https://ufl-cise.sona-systems.com) are eligible. Students will need to (1) create an account in the system, (2) select the correct course name and number for this class, and (3) schedule and participate in an approved study to receive credit.

Students who do not wish to participate in a research study to satisfy the "research awareness" component have the option to complete a research review of a current or recent HCI research project at UF by a faculty member in the CISE Department working in the research area of human-centered computing. This alternative assignment requires a 1-2 page written submission covering both: 1) a summary of a recent research paper by the chosen faculty member published in the past 2 years, and 2) a summary of an interview with a current graduate student working with the chosen faculty member. The interview should be about new research plans related to the summarized paper. Students who opt for the alternative format must notify the instructor by email prior to the date of the midterm exam.

## Extra Assignments (extra credit)

Per above, students may complete an additional "research awareness" component for an added 1% towards the overall class grade. Additional opportunities to earn extra credit are not promised and typically not available.

## Late policy

Students can submit assignments one day late to earn up to 50% of the assignment total; otherwise, a score of zero will be earned. The partial credit opportunity does not apply to exams, project deliverables, or research awareness components.

## Honor Code & Collaboration:

High level questions, procedures, and algorithms can be discussed amongst each other and amongst the students/groups. Not allowed in this course include the following:
1) **plagiarism** (misrepresenting others' ideas as your own, can often be fixed with simple citation),
2) **copying code**,
3) **social loafing** (e.g., for group work), and
4) work that is **offensive** to others.

# Course Policies

### Attendance:
This is an online class that follows a hybrid model for synchronous and asynchronous participation. Some

course content (course lectures, dissemination of information, demonstrations, presentations, activities) is designed for student participation during the scheduled class times. By default, students are responsible for planning virtual attendance and participation during class times unless otherwise stated. However, the class is also designed around many independent exercises intended to either supplement or replace some synchronous scheduled class period times. Students in this course must accept responsibility for keeping up with required readings, videos, deadlines, and meetings.

If a student is sick or will be absent (with a university-approved excused absence) for a significant period of time, please contact the instructor to work out a way to catch up. Providing the instructor with advanced notice (at least 2 weeks) is expected.

**Incomplete grade status:**
Incomplete grading status will be granted for only the most extreme circumstances, e.g., medical or family reasons. To be considered for an incomplete, the student **must** 1) let the professor know at in advance that they are seeking an incomplete, and 2) provide documentation to support the request.

Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

**Classroom Expectations:**
To be courteous to your fellow students, please:

- Be aware of your microphone. Please mute your microphone during class unless speaking.
- Be aware of your profile and background images. By default, **Zoom software saves settings for background images from previous sessions** and will be visible to the class**. Please be courteous to avoid inappropriate imagery that may be distracting or disrespectful to others.
- Be aware of appropriate personal appearance and surroundings. It is easy to forget when the camera is on.
- Your behavior and actions can also distract or portray disrespect to others. If you choose to step away from the computer during active presentation, lecture, or group activity, it is recommended that you turn your camera off first.

# University Policies and Resources

## University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code." On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied:
**"*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*"**

The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

For any group work, groups may collaborate with one another to discuss logistical aspects of the project, brainstorm implementation solutions, and otherwise solve challenges. Any collaborated code must have a citation (comment) that includes the source (group name) and the encompassing code. If a group member plagiarizes a portion of a written assignment, the entire group will be held responsible. Therefore, it is imperative to be cognizant of all the portions of the group project, not just your responsibility.

## Students Requiring Accommodations
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc ) by providing appropriate documentation. Once registered,

students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments.  For more information, please see:
http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

## UF Counseling Services
Resources are available on-campus for students having personal problems or lacking  clear career and academic goals. The resources include:

### Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc,
and 392-1575; and the University Police Department: 392-1111
or 9-1-1 for emergencies.

### U Matter, We Care:
Your well-being is important to the University of Florida.  The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to **look out for one another and to reach out for help if a member of our community is in need**.  If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress.  A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength.  In case of emergency, call 9-1-1.

If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.

## Safe and inclusive learning environment
The University of Florida shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@ufl.edu

*Sexual Discrimination, Harassment, Assault, or Violence*
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the Office of Title IX Compliance, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

## Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary

action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

## *Course Evaluation*

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

## Course Topics, Schedule, and Major Deadlines

This schedule is tentative and may change (notice will be given if changes are made).

| Tuesday | Thursday |
|---|---|
| Sep. 1 *<br>  Course introduction | Sep. 3 *<br>  Course introduction |
| Sep. 8 *<br>  Foundations | Sep. 10 *<br>  History |
| Sep. 15 *<br>  Design, affordances, and emotion<br>  **Reading:** Book Ch. 41 (all)<br>  **Reading:** Book 31.1 – 31.8<br>  **HW:** Design critique<br><br>  Project overview<br>  **HW:** preliminary project 1 milestone | Sep. 17 *<br>  User-centered design, personas, prototyping<br>  **Reading:** Book Ch. 46 (all)<br>  **Reading:** Book Ch. 47 (all)<br>  **HW:** Personas and prototypes |
| Sep. 22<br>  User-centered design II<br>  **Reading:** Book 53.1 - 53.9<br>  **Reading:** refer to agile homework<br>  **HW:** Agile homework | Sep. 24<br>  Ethics of working with people<br>  **Reading:** Book 53.10 - 53.15<br>  **HW:** CITI training |
| Sep. 29<br>  Perception and cognition<br>  **Reading:** Book 1.1 and 1.2<br>  **Reading:** Book Ch. 2 (all) | Oct. 1<br>  Visual design basics<br>  **Reading:** Book 14.1 – 41.20<br>  **Reading:** Book 8.5<br>  **HW:** Design scenario |
| Oct. 6 *<br>  Review and midpoint expectations<br><br>  Interviews, focus groups, questionnaires<br>  **Reading:** Book Ch. 55 (all) | Oct. 8<br>  Descriptive research, ethnography<br>  **Reading:** Book Ch. 45 (all)<br>  **HW:** questionnaires and descriptive research |
| **Oct. 13 ***<br>  **Midterm Exam** | Oct. 15<br>  Finalize plan for user study 1 |

| | |
|---|---|
| Oct. 20 * <br> **User study 1:** Project 1 usability testing <br><br> **HW:** Project 1 summary <br> **HW:** Peer design critique | Oct. 22 * <br> **User study 1**: Project 1 usability testing |
| Oct. 27 <br> Decision making <br> **Reading:** Book 22.1 - 22.2 <br> **Reading:** Book 26.3 | Oct. 29 <br> Formal models <br> **Reading:** Scott MacKenzie.Motor Behaviour Models for Human-Computer Interaction. Ed. John Carroll <br><br> Project 2 introduction <br> **HW:** preliminary Project 2 milestone |
| Nov. 3 (election day) <br> Qualitative analysis, grounded theory <br> **Reading:** Book Ch. 44 (all) <br> **HW**: Qualitative homework | Nov. 5 <br> Sensors and interaction data <br> **Reading:** Book 6.1 - 6.4 <br> **Reading:** Book Ch. 7 (all) |
| Nov. 10 * <br> Experimental research, Inferential statistics <br> **HW**: Statistics | Nov. 12 <br> Accessibility <br> **Reading**: Book Ch 35 (all) <br> **Reading**: Book 36.1 – 37.4 <br> **Reading**: Book 37.1 – 37.6 |
| Nov. 17 * <br> Data reporting and visualization <br> **Reading:** Albers Szafir. 2018. The Good, the Bad, and the Biased: Five Ways Visualizations Can Mislead (and How to Fix Them) <br> **HW:** Visualization | Nov. 19 <br> Virtual environments <br> **Reading:** Bowman & McMahan. 2007. Virtual reality: how much immersion is enough? <br> **Reading:** Bowman et al. 2012. Questioning Naturalism in 3D User Interfaces. |
| Nov. 24 * <br> Review and requirements | Nov. 26 <br> No class or office hours (holiday) |
| Dec. 1 * <br> **User study 2:** project 2 experiment | Dec. 3 * <br> **User study 2**: project 2 experiment |
| Dec. 8 * <br> **User study 2:** project 2 experiment <br><br> **HW**: Project 2 summary | Dec. 10 <br> No class or office hours (reading day) |

**Final Exam** *
Thursday, Dec 17, 2020 at 10:00 AM - 12:00 PM