

## CEN 4721 – Human-Computer Interaction

### CEN 4721 – Fall 2022

#### *Human-Computer Interaction*

T (AND0134): 10.40 am – 11.30 am

Th: (TUR2346): 10.40 am – 12.35 pm

## Instructor Information

- *Instructor:* Sharon Lynn Chu, Ph.D.
    - *Office:* CSE building, E422
    - *Office Hours:* Email me to set up an appointment
    - *Email:* [slchu@ufl.edu](mailto:slchu@ufl.edu)
      - Please add the course code in the subject line of emails sent to the instructor to ensure receipt of your emails, e.g., "CEN4721 HCI: Email topic"
    - *Personal website:* <https://cise.ufl.edu/~slchu/>
    - *Lab website:* <http://elxlab.cise.ufl.edu/>
  - *Teaching Assistant:* Joseph Isaac (PhD student)
    - *Office Hours:* Wednesdays, 2-3pm
    - *Office:* TBC
    - *Email:* [jisaacjr@ufl.edu](mailto:jisaacjr@ufl.edu)
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## Course Information

### Prerequisites

COP 3530 Data Structures with minimum grade of C, and any one programming course (CGS 2414, CGS 3460, or CGS 3464).

### Course Description

*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. Credits: 3.

*Notes.* This course will not teach programming or technical implementation. System development is required as part of the course project, but students are expected to either already have the necessary technical skills, or find out about them on their own.

### Who Is This Course For?

This course is directed towards **junior** and **senior** undergraduate students who wish to learn about core concepts and current research in the design and evaluation of human-computer interfaces. While the course requires some level of technical development, the emphasis is on the design, analysis, and evaluation of human-centered interfaces in accordance with common methodologies.

### How Does This Course Fit With Other Courses?

The HCI course has some overlaps with the *User Experience Design* course. However, the HCI course covers a broader perspective on the field of HCI and focuses on the evaluation of interfaces, whereas the User Experience Design course focuses on the design of interfaces.

## Learning Outcomes:

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

- Characterize and critique core concepts and methods of human-computer interaction
- Design and build human-computer interfaces
- Evaluate human-computer interfaces
- Be aware of research areas in human-computer interaction

## Programming

### *Tools and Languages*

You can use any development environment and programming language appropriate for class assignments or project work. 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 at least one interactive system.

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## Class Format and Components:

### Course Materials

- Material and Supply Fees: *None*
- Required Textbooks and Software: *None*
  - Required reading assignments will be given from articles and research papers. Those will be uploaded to the course website or will be available through the university's digital library subscriptions.
- Recommended (optional):
  - Design of Everyday Things, Donald Norman
  - The Human-Computer Interaction Handbook, Fundamentals, Evolving Technologies, and Emerging Applications. Edited by Julie A. Jacko. Third edition. \*Available through the UF library website.

## Privacy

Our class sessions may include virtual online sessions, which 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.

## In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for **personal** educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students **may not publish** recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class

lecture does **not** include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

## Course components

This course involves the following components:

- **Lectures** – Attend class lectures on core HCI topics and concepts
- **Readings** – Read, analyze and discuss assigned papers, book chapters or online resources related to HCI
- **Midterm test/Exam** – Take a test covering HCI concepts
- **Homeworks**– Participate in in-class group-based activities and submit products of these activities as homeworks
- **Project** – Complete a semester-long project that involves the design, implementation and evaluation of an interactive system
- **Research awareness** – Participation in CISE HCC experiment pool or written essays

### *Midterm Test/Exam*

One test and the final exam will be given throughout the semester. The test and exam will cover the lectures, readings that have been assigned, class activities and discussions, and homeworks. If students are late to take the test/exam, the instructor is not required to allow the students to take the test/exam. If the students fail to take the test at the time indicated, no make-up test will be given unless valid excuses with documentation are presented.

### *Homeworks*

Students will work on group-based activities in some classes (mostly on Thursdays). The results of these activities are expected to be submitted as homeworks one week later. While students will begin to work on the activities in class, it is likely that they will need to finish the activities outside of class to submit the homeworks.

### *Semester Project*

Students will work in teams to complete a semester-long research project involving the design, development, and evaluation of human-computer systems. Projects are expected to be in the context of HCI topics, methods, and theories covered in the course. More details on project concepts and expectations will be given in class. Early in the semester, teams will decide on project goals and develop a plan to be approved or revised by the instructor, and students will be expected to submit project progress deliverables throughout the semester. Unless otherwise stated, each team is expected to work together to produce stated deliverables.

### *Research Awareness*

This course encourages participation in research in human-computer interaction to provide knowledge and awareness 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 awareness component” of the grade.

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-page written submission covering both: 1) a half-page summary of a recent research paper by the

chosen faculty member published in the past 2 years, AND 2) a half-page 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 in-class test.

The research awareness component is a mandatory part of the course contributing 1% of the overall course grade.

#### *Extra Credit*

Students may participate in an additional SONA research study (1 credit minimum) for an added 1% towards the overall class grade. Additional opportunities to earn extra credit are not promised and typically not available.

### Software

Students are required to bring a laptop to class<sup>1</sup> to participate in both the in-class activities and project working sessions. It is the responsibility of the student to gain access to whatever software they may need to complete their assignments and projects.

### Course Communication

This course will use the Canvas e-Learning course management system to post grades and to communicate with class members. Details about all assignments and deliverables will be made available through Canvas. Students are responsible for checking Canvas regularly to keep track of assignments and due dates.

Please regularly check UF email and 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 penalty to be decided by the instructor. Please familiarize yourself with the content located at the following link: <https://teach.ufl.edu/wp-content/uploads/2020/04/NetiquetteGuideforOnlineCourses.docx>

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## Course Grading

### Course Grades

Students' performance in the course will be determined based on the table below. All individual submissions and deliverables of each component below will be graded out of a predetermined amount of points. The total score for a component will be converted to account for the %s as listed below.

• <b>Test/Exam</b>	<b>[32%]</b>
• <b>Homeworks</b>	<b>[25%]</b>
• <b>Semester project</b>	<b>[42%]</b>
• <b>Research awareness</b>	<b>[1%]</b>

### Grading Scale

Scale for overall course grade:

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| • 100 – 93: A   | • 79.9 – 77: C+ | • 62.9 – 60: D- |
| • 92.9 – 90: A- | • 76.9 – 73: C  | • 59.9 – 0 : E  |
| • 89.9 – 87: B+ | • 72.9 – 70: C- |                 |
| • 86.9 – 83: B  | • 69.9 – 67: D+ |                 |
| • 82.9 – 80: B- | • 66.9 – 63: D  |                 |

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<sup>1</sup> Consistent with UF College of Engineering computer requirements: "The University of Florida requires students to have access to a computer. The College of Engineering further requires that students have access to and on-going use of a laptop/mobile computer." For more information, see <http://www.eng.ufl.edu/students/career-resources/computer-requirements/>

All final course grades will be rounded to the nearest decimal number. Canvas estimates of final course grades are not to be considered accurate until they are officially announced by the instructor. The Canvas system has a “What If” tool if you want to do your own math to verify final grades.

A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## Course Policies

### *Class Attendance*

This class expects synchronous participation (that is, attendance at the scheduled class times). For virtual classes, 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 activities, assignments, readings, videos, and deadlines. 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.

Students are expected to attend all classes. While attendance is not directly graded, submissions based on in-class activities (e.g., in-class discussions) will be graded and may suffer if students fail to attend classes. If a student misses a session and is unable to provide the valid documentation required for an excused absence, the student will need to consult with other members of the class to determine what was missed. There is no provision for making up missed class participation credit for an unexcused absence. *It is the responsibility of the student to be aware of all deadlines and submissions of the course.* Deadlines will be posted in the syllabus and announced in class.

### *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 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>

### *Late Assignments*

**All assignments will be assessed a late penalty of -10% for each hour late.** The only exception to this rule is if students contact the instructor **in writing before the assignment due date** to make arrangements for lateness.

### *Group Project and Peer Evaluation*

Students will be required to complete one semester-long group-based project in this course. For the project, students in the team will each be asked to choose to be the lead for one aspect of the project. However, **all** team members are expected to contribute to **every** aspect of the project. The lead for a project aspect should not be doing all the work required for that aspect. The responsibility of the lead for an aspect is simply to organize that aspect of the project and ensure that progress is being made on that aspect.

Peer evaluation will be conducted by having each team member fill in a questionnaire. Each team member will have the opportunity to indicate the amount of contribution and a description of the contribution of each member of the team to the project. Based on the description of the contribution, the instructor will assign a weight to individual team members' project score. The weight can either provide a penalty or boost to the student's project score, if so warranted.

### *Virtual Classroom Expectations*

The class may include virtual, online activities. 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.
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## University Policies

### University and Class Honesty Policy

The Honor Pledge 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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.

You are required to abide by the Student Honor Code. **ANY** violation of the academic integrity expected of you, however small, will result in a minimum academic sanction of failing (getting a 0 on) the assignment involved. Violations that are more serious in nature may result a referral to Student Conduct and Conflict Resolution and failing of the course.

Violations include **plagiarism of any scale**. If you are not familiar with plagiarism, please see [plagiarism.org](http://plagiarism.org). It is YOUR responsibility to educate yourself on what constitutes plagiarism. Ignorance will not be accepted as an excuse for plagiarism or any other violations of academic integrity.

Please review the Student Honor Code and Student Conduct Code at [sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/](https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/)

### 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.

### 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/>.

### Americans with Disabilities Act (ADA) Policy

Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

### Commitment to a Safe and Inclusive Learning Environment

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](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.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.

## 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: <https://registrar.ufl.edu/ferpa.html>

## Mandatory Reporting

As an employee of the University of Florida and the State of Florida, your instructor is a **mandatory reporter** for all suspected or alleged violations of sexual harassment, discrimination, threats of harm to one's self or others, and UF honor code violations.

## Campus Resources:

### *Health and Wellness*

#### **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](mailto: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.

#### **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.

#### **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](mailto:title-ix@ufl.edu)

#### **Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

### *Academic Resources*

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus**: [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints**: <http://www.distance.ufl.edu/student-complaint-process>.



CEN 4721 Human-Computer Interaction  
**WEEKLY SCHEDULE** (Subject to Change)

**KEY:**

Text	General	Text	Analysis
Text	Design	Text	Project
Text	Studies	Text	Test/Exam

*Note1:* Readings listed are required. Readings need to be done before the class with which they are listed.

*Note2:* All classes will be in-person unless otherwise noted.

*Note3:* As far as possible, HWs will be started as class activities the Thursdays before the HWs are due.

Tuesdays	Thursdays
	Aug. 25 Course overview Intro to HCI
Aug. 30 Project Description	Sept. 1 Affordances and Mental Models <i>Readings: The 6 principles of design; What are Norman's principles of design?</i>
Sept. 6 Perception and Cognition <b>HW 1 due: Design analysis</b>	Sept. 8 Project Pitches <b>Project due: Team + Pitch + Preliminary plan</b>
Sept. 13 History of HCI	Sept. 15 User-centered design <i>Reading: Personas (usability.gov)</i>
Sept. 20 Paradigms of HCI <b>HW 2 due: Website redesign</b>	Sept. 22 Formal Models <b>Project due: Design wireframes</b>
Sept. 27 IRB and Ethics <b>HW 3 due: Keystroke-level modeling</b>	Sept. 29 Basics of User Studies
Oct. 4 Usability Testing <b>HW 4 due: IRB training</b>	Oct. 6 Usability Testing
Oct. 11 <b>MIDTERM TEST</b> <i>(Test will be online on Canvas – no class)</i>	Oct. 13 HCI areas overview
Oct. 18 Experiments <b>Project due: System video</b>	Oct. 20 HCI research project example I
Oct. 25 Statistical analysis <b>Project due: Usability test plan</b>	Oct. 27 Project work – Usability testing
Nov. 1 Qualitative data analysis <b>HW 5 due: Statistical analysis</b>	Nov. 3 Qualitative data analysis <i>Reading: Affinity diagramming (Interaction Design Foundation, Medium.com)</i> <b>Project due: Experiment plan</b>
Nov. 8 HCI research project example II	Nov. 10 Data reporting and visualization <b>HW 6 due: Qualitative analysis</b>

Nov. 15	Nov. 17
Project work - Experiment	Project work - Experiment
Nov. 22	Nov. 24
No class	No class
Nov. 29	Dec. 1
Project presentations	Project presentations
<i>Project due: Presentation slides</i>	
Dec. 6	Dec. 8
Review	No class
<i>Project due: Final deliverables</i>	<i>Project due: Peer evaluation survey</i>
	Dec. 15
	<b>FINAL EXAM</b> (Exam will be online on Canvas)