Human Factors Applications

EIN 4245

Class Periods and Location: MWF Period 9 (4:05 pm – 4:55 PM)

Location: FLG 0285

Academic Term: Spring 2024

Instructor: Wayne Giang, wayne.giang@ise.ufl.edu, 352-294-7729, Weil 479, Office Hours: M,W, 2-3pm.

Course Description

Focuses on applications of advanced topics in human factors and design within various industrial engineering related domains. Students will be introduced to important domains for human factors work in industry and academia, such as user experience in information technology, healthcare human factors, traffic safety and driving, aviation, and command and control. Students will apply human factors methods and concepts to problems within these domains through case study projects and assignments.

Course Pre-Requisites

EIN3241 (Human Factors and Ergonomics I), ESI3215C (Data Analysis for Industrial Applications)

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. Identify, formulate, and solve engineering problems	High
2. Apply engineering design … consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors	Medium
3. Communicate effectively with a range of audiences	Medium
4. Recognize ethical and professional responsibilities … impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. Function effectively on a team … provide leadership, create a collaborative and inclusive environment …	Medium
6. Develop and conduct appropriate experimentation, analyze, and interpret data …	
7. Ability to acquire and apply new knowledge as needed …	

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not part of the course.

Course Objectives

At the conclusion of this course, students will be able to:

- Describe traditional and emerging domains where human factors work is conducted;
- Demonstrate comprehension of human factors skill and methods;
- Develop human factors solutions to real-world problems through case studies;
- Write and present human factors reports and presentations.

Required Textbooks and Software

- No textbook. Supplemental readings will be provided.

Course Schedule

Week	Date	Lecture Number	Topic
1	M 1/8	1	Course Introduction, first readings assigned (online recording) – *no class*
	W 1/110		*Class Cancelled – no class*
	F 1/12	2	**Domain Topic: Digital Usability and User Experience for Consumers** (Case Study 1 assigned)
2	M 1/15		*MLK day – no class*
	W 1/17	3	Usability and User Experience Principles 1 **[Reflection 1 Due]**
	F 1/19	4	Usability and User Experience Principles 2
3	M 1/22	5	Applications in Design and Prototyping 1
	W 1/24	6	Applications in Design and Prototyping 2
	F 1/26	7	Case Study Discussion **[Quiz and Reflection 2 Due]**
4	M 1/29	8	***Guest Lecture: UX Design* – Samantha Yuan, UX Manager @ Shopify**
	W 1/31	9	***Guest Lecture: UX Research* – Diba Kaya, Senior UX Researcher @ ITHAKA**
	F 2/02	10	**Case Study 1 Presentations and Submission**
5	M 2/05	11	**Domain Topic: Human Factors in Healthcare**
	W 2/07	12	Methods and Frameworks for Human Factors in Healthcare 1 (Case Study 2 assigned)
	F 2/9	13	Methods and Frameworks for Human Factors in Healthcare 2
6	M 2/12	14	Applications of Evaluation Methods in System Evaluation 1
	W 2/14	15	Applications of Evaluation Methods in System Evaluation 2
	F 2/16	16	Setting Up a Usability Test
7	M 2/19	17	Special Topic: Ethics in Research and Design **[Quiz and Reflection 3 Due]**
	W 2/21	18	Case Study Work Time
	F 2/23	19	***Guest Lecture: University of Florida IRB (Recording)***
8	M 2/26	20	***Human Systems Engineering Lab Visit (Reed 106)***
	W 2/28	21	***Guest Lecture: Patient Safety* – Dr. Megan Gregory, Associate Professor, Department of Health Outcomes & Biomedical Informatics @ UF**
	F 3/01	22	**Case Study 2 Presentations and Submission**
9	M 3/04	23	**Domain Topic: Human Factors in Transportation**
	W 3/06	24	Human Information Processing within Driving 1 (Case Study 3 assigned)
	F 3/8	25	Human Information Processing within Driving 2
	M 3/11		*Spring Break – No class*
	W 3/13		*Spring Break – No class*
	F 3/15		*Spring Break – No class*
10	M 3/18	26	Case Study Work Time **[Quiz and Reflection 4 Due]**
	W 3/20	27	Training, Regulation, and Policies
	F 3/22	28	***Guest Lecture: Human Factors Consultancy and Forensics in Transportation* -**

			Liberty Hoekstra-Atwood, Senior Scientist @ Exponent
11	M 3/25	29	***Guest Lecture: Transportation Safety***
	W 3/27	30	**Case Study 3 Presentations and Submission**
	F 3/29	31	**Domain Topic: Human-Robot Collaboration in Warehousing and Commerce** (Case Study 4 assigned)
12	M 4/01	32	**Domain Topic: Human-Automation in Command and Control**
	W 4/03	33	Human Automation Interaction 1
	F 4/05	34	Human Automation Interaction 2
13	M 4/8	35	Human Robot Interaction
	W 4/10	36	Special Topic: Using standards in HF work
	F 4/12	37	***Guest Lecture: HRI Standards***
14	M 4/15	38	***Guest Lecture: Human Robot Collaboration Speaker***
	W 4/17	39	Case Study Work Time **[Quiz and Reflection 5 Due]**
	F 4/19	40	Interface Designs for Complex Systems 1
15	M 4/22	41	Interface Designs for Complex Systems 2
	W 4/24	42	**Case Study 4: Presentations and Submission**

Evaluation of Grades

Assignments	**Short Description**
Four Cases: 60% Case 1: 15% Case 2: 15% Case 3: 15% Case 4: 15%	Four cases on selected topics in human factors and associated methods and concepts. Cases will be prepared in groups. Cases may require additional supplementary readings to complete. Each report will contain development, analysis, and solutions. Additional information about the reports will be given in handouts for each assignment. Reports must be professional for delivery to a hypothetical "client". Students will be assigned groups, groups will be changed after the first two case studies. Individual grades may be adjusted based on the peer evaluation submitted with each assignment. For each case study, your group will also be responsible for a: • Work plan and assignment of responsibilities • Statement of work responsibilities at submission and peer evaluation
Presentations: 20% (10% for each presentation)	Groups will be responsible for two presentations throughout the semester (chosen from the 4 possible presentations). Each presentation is worth 10% (50% attributed to the individual, and 50% attributed to the group). Group members are expected to contribute equally to the preparation and presentation of each case. You will be graded on the delivery and content of your presentation.
Quizzes and Reflections: 20% (4% per module: introduction, case 1, case 2, case 3, and case 4)	For each module of the course, there will be an online quiz (through Canvas) and a short written reflection based on the readings, lectures, and guest lectures. This is an individual activity and must be done alone. You are not allowed to use AI tools for quizzes and reflections.

Grading Policy

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

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

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, 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/.

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.

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://sccr.dso.ufl.edu/process/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 in this class.

The use of AI Tools

Students must obtain approval from the course instructor before using any artificial intelligence (AI) tools, such as ChatGPT, in their coursework. This approval must be obtained as early as possible. If permission is granted, students must provide a clear plan outlining their intended use of the AI tool. The instructor reserves the right to prohibit any use of AI tools that do not align with the assignment's pedagogical and evaluation requirements. Submitting work that has been entirely written by AI or that goes against the instructor's instructions is strictly prohibited and will be considered a violation of the university's academic honesty policy for this class.

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
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@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@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

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 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: https://counseling.ufl.edu, 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

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 suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*: https://distance.ufl.edu/state-authorization-status/#student-complaint*.