

**Human Factors in Health Care Engineering Systems**  
**Industrial Engineering/Educational Psychology 546:**  
University of Illinois at Urbana-Champaign  
Department of Industrial and Enterprise Systems Engineering  
Fall 2023

**Course Description**

Complex health care systems often challenge providers, patients, and other health system participants, contributing to problems that threaten patient and provide safety, increase provider workload, reduce quality of care, and increase the cost of health care. This course overviews research that applies theories and methods from human factors and cognitive science to analyze the sources of these problems and to develop and evaluate design and training interventions to help providers and patients successfully navigate health care systems. An introduction to health care problems and accidents related to human factors is followed by an overview of concepts and methods from the fields of human factors and cognitive science. This background provides a foundation for considering specific topics related to human factors in health care. Topics range from provider and patient interaction with medical devices to collaboration and teamwork, concluding with broader socio-technical issues such as the impact of health information technology on clinical work.

**Credits:** 4

**Schedule:**

Lectures: Mondays and Wednesdays, 2:00-3:20 pm (central time),  
3025 Campus Instructional Facility (CIF)

**Instructor:**

Dr. Abigail R. Wooldridge  
Office: 209A Transportation Building  
Lab: 2311/2313 DCL  
Email: [arwool@illinois.edu](mailto:arwool@illinois.edu)  
Phone: 217-300-8086  
Office Hours: Wednesday 12:45-1:45 pm, 2311 DCL [note: extra office hours held in first 3 weeks]  
Or by appointment

**Course content**

Provides an overview of research that applies theories and methods from human factors and ergonomics to analyze the sources of these problems and to develop and evaluate design and training interventions to help providers and patients successfully navigate health care systems. An introduction to problems and accidents in health care related to human factors is followed by an overview of concepts and methods from the fields of human factors and ergonomics.

**Readings:**

***This is a reading intensive, graduate level class.*** Readings are available on the website of the course: <https://canvas.illinois.edu/>. Class time will be spent discussing the book chapters, papers, reports, etc. This discussion will allow you to apply the material covered in the readings. Each week, students will be in charge of leading the discussion (see assignment description, below).

**Course website:** <https://canvas.illinois.edu/>

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the Canvas Learning Management System course website at <https://canvas.illinois.edu/>. You are responsible for regularly checking the course site as well as your email and canvas announcements to learn of any updates. Note: Class material is copyright to the University of Illinois at Urbana-Champaign and should not be distributed or disseminated.

**Grading Scale: Straight (i.e., no +/-)**

90% and up: A      80% - 89%: B      70% - 79%: C      60% - 69%: D      below 59%: F

**Grade Determination and Assignments**

| Item                                    | Points  |
|---|---|
| Student Bio Survey                      | 5 points out of maximum 5 points  |
| Office Hours Visit                      | 5 points out of maximum 5 points  |
| Class Participation                     | Score out of maximum 15 points  |
| Weekly Reflection Journal               | Score out of maximum 15 points  |
| Leading One Activity Class (Weeks 7-15) | Score out of maximum 30 points  |
| System Analysis (Group) Project Topic   | Score out of maximum 5 points   |
| System Analysis (Group) Project Outline | Score out of maximum 5 points   |
| System Analysis (Group) Final Project   | Score out of maximum 20 points  |
| <i>Extra Credit (optional)</i>          | <i>Extra credit points will be available over the course of the semester as described below; additional opportunities may be announced during class</i> |
| <b>Total</b>                            | Sum of the above, out of 100 points   |

**Class Participation (15 points):**

Participation is what you would expect: Attend class and contribute!

**Reflection Journal (15 points):**

The reading journal encourages active reading of the required readings (and integrating concepts from articles, lectures, and discussion) and reflection on class discussion. For each article, you should summarize the main points of the papers (a brief paragraph about the goals, key findings, and conclusions), the discussions in class that week and integrate the readings and discussions to reflect on the topic of the week; you may also pose questions that remain for you. A good journal entry is complete but concise and reflects an attempt to work through the material. Your goal in these assignments is to ensure and demonstrate that you critically read the readings, participated in the class discussions and integrated the ideas together.

**FORMAT:**

- Canvas group discussion (fine to upload word document or enter text directly)
- Maximum of 2 pages (preferrable: half a page per reading)
- Double spaced lines
- 11 point Arial
- 1 inch margins
- Run the spell checker and check the English.
- APA format for references (if you use them).

**Leading Activity Class (30 points):**

Three-four students lead discussion of one or more topics. The presentation involves briefly summarizing and leading class discussion about the readings (**no more than 30 minutes total**). A good presentation summarizes the paper(s) so everyone is on the same page for discussion, elaborates the paper in some way (e.g., presenting related or updated material from the web or from your own experience), and helps students integrate the presented paper with other course concepts. The remaining portion of the class should be an activity that you have designed in your group that encourages critical thinking and engagement of the course. Examples of possible activities include: debates, case study with solution design based on readings or patient safety events, developed questions for teams to answer and present on, TV game show activities (e.g., Family Feud, Jeopardy), etc. Please be creative and thoughtful! Grading of the class leading is based on adequacy of the article discussion, activity design, and encouraging class participation. Feel free to talk with me when preparing presentations!

See course schedule for deadlines and topics.

### **System Analysis (Group) Project (20 points):**

Students may work individually or in groups up to 4 for this assignment, which involves both a class presentation and paper/report. The assignment provides an opportunity to 'drill down' and work with course concepts of interest to better understand aspects of patient safety related to human factors covered in the course. You will identify an important problem related to patient safety (for example, a type of adverse event such as wrong-site surgery or giving the wrong medication to a patient; the impact of EHRs on clinical workload), analyze why it occurs, and develop an approach to address the problem. There are four parts to the project.

- **Introduction and Background.** This part has two sub-sections. First, describe in detail a specific case/example of the problem, based on the literature, media reports, or other sources. For example, in addition to describing the general problem that nurses can confuse patient medications, also describe and analyze an actual incident that you think is representative of the problem. This would include an analysis of factors contributing to the incident (a "root cause analysis"). Second, conduct a literature review to find out what is already known about this type of problem (more generally), focusing on human factors issues related to preventable errors and other factors that contribute to the problem and its consequences.
- **Develop an approach to address the problem.** How (and why) will this approach reduce the likelihood that the problem will occur, and/or mitigate the effects of this problem if it does occur?
- **Describe how you would evaluate the effectiveness of your approach.** The evaluation should involve one (or likely more) of the following methods: direct observation, analysis of incident/error reports or patient records; interviewing participants, usability testing, experiment (e.g., involving simulation of the target activities), or modeling of the processes involved. This section will also include expected results from the evaluation, and what new procedures, technology, or other products would result from your project.
- **Conclusion.** This part summarizes the main points in the paper. It should also include possible new procedures, technology, or other products that might result from your project.
- **References** – should be APA format.

Ideally, this project would involve going to an actual health care setting to study the problem and perhaps evaluate changes that address the problem, but this would be hard to do in one semester, so we'll stick with the hypothetical!

### *Project Deliverables (see course schedule for dates):*

- Team with topic ideas
- Topic proposal – following form on Canvas (5 points)
- Project outline – following sections above, with bullet outline for each (5 points)
- Class presentation (10 points) – Each student/group will present their project to the class (using power point or other presentation software), which summarizes their paper/report. Group members should work together on all parts of the project.
- Project Report/Paper (10 points) – The report takes the form of a written paper, which should be 10-15 pages, 12-pt font and double-spaced. The report should be organized according to the four sections described above. Include a title page (this doesn't count toward page limits). When using information from published sources in the presentation and report (this will often be course readings, but you can certainly use other sources as well), include citations and references, which also do not count toward page limits. Use APA format for citations and references, and list references at the end of the paper. *Finally, it always helps to include pictures and/or diagrams to illustrate the system and how you would redesign it!!*

More information and rubrics will be provided about this project later in the semester.

### *Final Presentation + Report/Paper Grading*

I will grade by a rubric (which will be provided later in the semester). However, your score will also include input from your group members, as follows. When in groups, students will evaluate their peers using CATME

For example, consider a 4-person team that earned a score of 95% (19 of 20 points). The table below demonstrates how the scaling will work. (A 1 person team will just evaluate themselves)

| Student | CATME Adj Factor (w/o self) | Final Project Score (Earned Score * CATME Scaling Factor) |
|---------|-----------------------------|---|
| 1       | 1                           | $19 * 1 = 19$   |
| 2       | 1.4                         | $19 * 1.4 = 26.6$   |
| 3       | 1.2                         | $19 * 1.2 = 22.8$   |
| 4       | 0.4                         | $19 * 0.4 = 7.6$  |

### Extra Credit:

You can earn 0.5 extra credit point (to be added on to your final grade, i.e., worth 0.5% extra) by coming to my office hours any week other than the first three weeks to *have a conversation* (can be about this course, it could be about the broader HFE field, career advice, life advice, etc.). This can be repeated each week, except for fall break and after the last day of class, for a total of 6 extra credit points over the course of the semester. Other opportunities for extra credit may be announced in class throughout the semester.

### Email policy

Please check the syllabus and Canvas before asking questions. When sending an email, observe the following rules or professionalism:

- Title the email “**HF in HCES – (subject of your email)**” in the subject line. This prevents your email from going to the junk folder.
- Maintain [professional etiquette](#), including a respectful greeting, and clear, polite body of the email.
- Frame your question clearly and professionally. Include all relevant information about what you need up front.
- Email in advance. Allow 48 business hours for a response.

### Expectations for course meetings

- Participate in class discussions, contribute individual experiences when relevant to the topic so that others can benefit and learn
- Ask questions...there is no bad question if you learned something from the response
- Maturity and respect for others is mandatory (see statement on diversity).
- Cell Phones should be turned off at the beginning of class unless you are emergency personnel on-call. Activation or use of a cell phone will be penalized.
- Use other electronic devices (tablets, laptops, etc.) for course-related purposes only. Do not bring any electronic devices to exams.
- Take individual responsibility for completing assignments on time.
- Check e-mail and Canvas frequently (just not in class)
- All readings should be completed prior to class (except for first day, but those need to be done before the first lab).
- Class begins and ends on time. Arriving late or leaving early may result in missed points on the exercise.

### Absences and make up/late assignments

Students are expected to attend every class. However, it is understood that there may be times when absences are unavoidable, such as illness. For every absence, the student must 1) read all readings, 2) prepare a 3-page document addressing key points in the readings, points of discussion, and responses to these discussion points, 3) email this paper to me (on the Friday before the class to be missed for a planned absence or within a week after the class for an unplanned absence), and 4) speak with another student about the in-class discussion.

## Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at <https://odos.illinois.edu/community-of-care/resources/students/religious-observances/> to request appropriate accommodations. This should be done in the first two weeks of classes.

## Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/>.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <https://studentcode.illinois.edu/article1/part4/1-401/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

I will enforce the university's standards of Academic Integrity. All alleged infractions will be documented in the campus-wide FAIR database and investigated, and all committed infractions will result in sanctions.

## Accommodations for Individuals with Disabilities

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible **during the first week of the course**. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail [disability@illinois.edu](mailto:disability@illinois.edu) or go to the <http://www.disability.illinois.edu/>. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available on campus that can help diagnosis a previously undiagnosed disability by visiting the DRES website and selecting "Sign-Up for an Academic Screening" at the bottom of the page. I am happy to follow your DRES accommodations but do need them to know what to do – please feel free to see me after class, during office hours or by appointment.

## Additional University Resources

If you are interested in obtaining information to improve writing, study skills, time management or organization, the following campus resources are available to all students:

- Library Savvy Researcher workshops and guides
  - <https://calendars.illinois.edu/list/4068>
  - [https://guides.library.illinois.edu/sb.php?subject\\_id=70338](https://guides.library.illinois.edu/sb.php?subject_id=70338)
- Graduate College Grant Writing Workshops and Resources
  - <https://grad.illinois.edu/fellowship/external-workshops>
  - <https://grad.illinois.edu/fellowship/external-resources>
- Writer's Workshop
  - Undergrad Library
  - 217-333-8796
  - <https://writersworkshop.illinois.edu>
  - Offers consultations, workshops, resources, etc. Explore their website!
- <http://www.cws.illinois.edu/workshop>
- <https://www.disability.illinois.edu/strategies>
- <http://www.counselingcenter.illinois.edu/self-help-brochures/>

Also, most college offices and academic deans provide academic skills support and assistance for academically related and personal problems. Links to the appropriate college contact can be found by going to this website and selecting your college or school: <http://illinois.edu/colleges/colleges.html>

If you are experiencing symptoms of anxiety or depression or are feeling overwhelmed, stressed, or in crisis, you can seek help through the following campus resources:

Counseling Center  
206 Student Services Building  
7:50 a.m.-5:00 p.m., Monday through Friday  
Phone: 217-333-3704

McKinley Mental Health  
313 McKinley Health Center  
8:00 a.m.-5:00 p.m., Monday through Friday  
Phone: 333-2705

McKinley Health Education offers individual consultations for students interested in learning relaxation and other stress/time management skills, call 333-2714.

The following resources or programs may be useful to you – please use them if you need!

#### Technology Loan Program

Visit the Technology Loaner Program page for technology loan information. <https://answers.uillinois.edu/illinois/99680>

The Technology Loan Program is a partnership established across the campus IT community to loan technology hardware to eligible students who have unmet needs. This includes the loaning of computers, peripherals, and internet hotspot technologies to support online learning and work-from-home activities for the duration of the COVID-19 crisis.

#### Student Assistance Center

If a student does not have access to functional computers or internet connectivity, they can contact the Student Assistance Center at 217-333-0050 or [helpdean@illinois.edu](mailto:helpdean@illinois.edu). The Center serves as the first point of contact for students who contact the Office of the Dean of Students. The Assistant Deans help students understand university policies and procedures, educate them about and connect them to campus resources, and support students in crisis. <https://odos.illinois.edu/community-of-care/student-assistance-center/#utilize>

#### Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.

#### Sexual Misconduct Policy and Reporting

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options. I am a mandatory reporter. A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: <https://wecare.illinois.edu/resources/students/#confidential>. Other information about resources and reporting is available here: [wecare.illinois.edu](https://wecare.illinois.edu).

#### Statement on Diversity and Inclusion

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national

origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (<https://bart.illinois.edu/>). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued for any reason, please speak with me privately. If you wish to communicate anonymously, you may do so in writing. We are all members of an academic community where it is our shared responsibility to cultivate a climate where all students/individuals are valued and where both they and their ideas are treated with respect. Developing and maintaining that climate is part of the expectations for this course.

If you have made it this far paying attention, thank you. Email me a picture of your favorite living being (animal, insect, etc.) before the second class, using the correct subject line format with your name in the subject line to receive 1 extra credit point.

### **General Emergency Response Recommendations**

Emergency response recommendations can be found at the following website: <https://police.illinois.edu/em/run-hide-fight/>. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>. Check out campus safety video and be sure to join Illini Alerts. Here is a handout they requested we share with you.

## Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.



### Run

**Leaving the area quickly is the best option if it is safe to do so.**

- ▶ Take time now to learn the different ways to leave your building.
- ▶ Leave personal items behind.
- ▶ Assist those who need help, but consider whether doing so puts yourself at risk.
- ▶ Alert authorities of the emergency when it is safe to do so.



### Hide

**When you can't or don't want to run, take shelter indoors.**

- ▶ Take time now to learn different ways to seek shelter in your building.
- ▶ If severe weather is imminent, go to the nearest indoor storm refuge area.
- ▶ If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area if possible, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.



### Fight

**As a last resort, you may need to fight to increase your chances of survival.**

- ▶ Think about what kind of common items are in your area which you can use to defend yourself.
- ▶ Team up with others to fight if the situation allows.
- ▶ Mentally prepare yourself – you may be in a fight for your life.

Please be aware of people with disabilities who may need additional assistance in emergency situations.

## Other resources

- ▶ [police.illinois.edu/safe](https://police.illinois.edu/safe) for more information on how to prepare for emergencies, including how to run, hide or fight and building floor plans that can show you safe areas.
- ▶ [emergency.illinois.edu](https://emergency.illinois.edu) to sign up for Illini-Alert text messages.
- ▶ Follow the University of Illinois Police Department on Twitter and Facebook to get regular updates about campus safety.



## Schedule

| Week | Date      | Day | Topic  | Reading  | Discussion Leader(s) |
|------|-----------|-----|--|--|----------------------|
| 1    | 8/21/2023 | Mon | Introduction to course, review syllabus. What is human factors/ergonomics?   | None before class. After class, read <a href="https://iea.cc/about/what-is-ergonomics/">https://iea.cc/about/what-is-ergonomics/</a> | Prof. Wooldridge     |
|      | 8/23/2023 | Wed | Why does health care need human factors/ergonomics?  | <i>Safer Healthcare</i> Ch. 1, 4   | Prof. Wooldridge     |
|      | 8/27/2023 | Sun | <b>Week 1 due date (no class meeting):</b><br>Student Bio due by 11:59 p.m. via Canvas<br>Weekly reflection due by 11:59 p.m. via Canvas                 |  |                      |
| 2    | 8/28/2023 | Mon | Physical Ergonomics Overview   | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 15, 16   | Prof. Wooldridge     |
|      | 8/30/2023 | Wed | Physical Ergonomics Activity   | Lavender et al. (2015)<br>Joseph and Rashid (2007)   | Prof. Wooldridge     |
|      | 9/3/2023  | Sun | <b>Week 2 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |  |                      |
| 3    | 9/4/2023  | Mon | <b>Labor Day - no class</b>  |  |                      |
|      | 9/6/2023  | Wed | Cognitive Ergonomics Overview + take home activity   | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 18<br>Wickens and Carswell (2017)                              | Prof. Wooldridge     |
|      | 9/10/2023 | Sun | <b>Week 3 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas<br>Office hours visit must be completed by end of the week. |  |                      |
| 4    | 9/11/2023 | Mon | Macroergonomics Overview   | Carayon et al. (2013)  | Prof. Wooldridge     |
|      | 9/13/2023 | Wed | Macroergonomics Activity   | Carayon et al. (2022)<br>Holden et al. (2015)  | Prof. Wooldridge     |
|      | 9/17/2023 | Sun | <b>Week 4 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |  |                      |
| 5    | 9/18/2023 | Mon | What is safe high quality care?  | <i>Safer Healthcare</i> Ch. 2, 3   | Prof. Wooldridge     |

NOTE: Schedule subject to change with fair notice, check “Announcements” on Canvas for updates.  
Last updated: August 17, 2023

| Week | Date       | Day | Topic  | Reading   | Discussion Leader(s) |
|------|------------|-----|--|---|----------------------|
|      | 9/20/2023  | Wed | Systems Engineering Initiative for Patient Safety  | Carayon et al. (2006)<br>Carayon et al. (2020)  | Prof. Wooldridge     |
|      |            |     |  | Recommended:<br>Carayon et al. (2014)<br>Holden et al. (2013)<br>Holden and Carayon (2021)                |                      |
|      | 9/24/2023  | Sun | <b>Week 5 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |   |                      |
| 6    | 9/25/2023  | Mon | No class - work day  |   | None.                |
|      | 9/27/2023  | Wed | No class - work day  |   | None.                |
|      | 10/1/2023  | Sun | <b>Week 6 due date (no class meeting):</b><br>Project teams with tentative topic ideas due by 11:59 p.m. via Canvas<br>In-class activity groups sign up due by 11:59 p.m. via Google Sheets (link on Canvas) |   |                      |
| 7    | 10/2/2023  | Mon | HF/E in the hospital - Emergency Department  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 41<br><i>Safer Healthcare</i> Ch. 7 | Prof. Wooldridge     |
|      | 10/4/2023  | Wed | HF/E in the hospital - Emergency Department Activity   | Salwei et al. (2021)<br>Catchpole et al. (2022)   | 1.<br>2.<br>3.       |
|      | 10/8/2023  | Sun | <b>Week 7 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |   |                      |
| 8    | 10/9/2023  | Mon | HF/E in the hospital - Operating Room  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 45, 48                              | Prof. Wooldridge     |
|      | 10/11/2023 | Wed | HF/E in the hospital - Operating Room Activity   | Berenholtz et al. (2009)<br>Hallbeck et al. (2017)  | 1.<br>2.<br>3.       |

NOTE: Schedule subject to change with fair notice, check “Announcements” on Canvas for updates.  
Last updated: August 17, 2023

| Week | Date       | Day | Topic   | Reading   | Discussion Leader(s) |
|------|------------|-----|---|---|----------------------|
|      | 10/15/2023 | Sun | <b>Week 8 due date (no class meeting):</b><br>Project topic proposal due by 11:59 p.m. via Canvas<br>Weekly reflection due by 11:59 p.m. via Canvas |   |                      |
| 9    | 10/16/2023 | Mon | HF/E in primary care  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 44<br><i>Safer Healthcare</i> Ch. 9 | Prof. Wooldridge     |
|      | 10/18/2023 | Wed | HF/E in primary care activity   | Temte et al. (2020)<br>Holman et al. (2016)   | 1.<br>2.<br>3.       |
|      | 10/22/2023 | Sun | <b>Week 9 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas  |   |                      |
| 10   | 10/23/2023 | Mon | No class - project work day   |   | None.                |
|      | 10/25/2023 | Wed | No class - project work day   |   | None.                |
|      | 10/29/2023 | Sun | <b>Week 10 due date (no class meeting):</b><br>Project paper outline due by 11:59 p.m. via Canvas   |   |                      |
| 11   | 10/30/2023 | Mon | HF/E in health care across lifespan - older adults  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 44<br><i>Safer Healthcare</i> Ch. 8 | Prof. Wooldridge     |
|      | 11/1/2023  | Wed | HF/E in health care across lifespan - older adults activity   | Morrow et al. (2021)<br>Arbaje et al. (2019)  | 1.<br>2.<br>3.       |
|      | 11/5/2023  | Sun | <b>Week 11 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |   |                      |
| 12   | 11/6/2023  | Mon | HF/E in health care across lifespan - pediatrics  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 42<br><i>Scanlon et al. (2006)</i>  | Prof. Wooldridge     |

NOTE: Schedule subject to change with fair notice, check “Announcements” on Canvas for updates.  
Last updated: August 17, 2023

| Week | Date       | Day | Topic   | Reading   | Discussion Leader(s) |
|------|------------|-----|---|---|----------------------|
|      | 11/8/2023  | Wed | HF/E in health care across lifespan - pediatrics activity   | Cox et al. (2017)<br>Barton et al. (2021)   | 1.<br>2.<br>3.       |
|      | 11/12/2023 | Sun |   |   |                      |
| 13   | 11/13/2023 | Mon | HF/E in care transitions  | <i>Handbook of Human Factors in Healthcare and Patient Safety</i> Ch. 11<br><i>Werner et al. (2016)</i> | Prof. Wooldridge     |
|      | 11/15/2023 | Wed | HF/E in care transitions activity   | Wooldridge et al. (2022)<br>Abraham et al. (2016)   | 1.<br>2.<br>3.       |
|      | 11/19/2023 | Sun | <b>Week 13 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas   |   |                      |
| 14   | 11/20/2023 | Mon | <b>Fall Break - no class</b>  |   |                      |
|      | 11/22/2023 | Wed |   |   |                      |
|      | 11/26/2023 | Sun |   |   |                      |
| 15   | 11/27/2023 | Mon | Current topic TBD (e.g., HF/E in pandemic, clinician burnout, maternal health equity, etc.)   |   | Prof. Wooldridge     |
|      | 11/29/2023 | Wed | Current topic TBD activity  |   | 1.<br>2.<br>3.       |
|      | 12/3/2023  | Sun | <b>Week 15 due date (no class meeting):</b><br>Weekly reflection due by 11:59 p.m. via Canvas<br>Final project paper due by 11:59 p.m. via Canvas |   |                      |
| 16   | 12/4/2023  | Mon | Project Presentations   | None.   | None.                |
|      | 12/6/2023  | Wed | Project Presentations   | None.   | None.                |
|      | 12/7/2023  | Thu | <b>Reading day - no classes! Good luck preparing for finals</b>   |   |                      |
| 17   | TBD        | TBD | No Exam.<br>CATME Peer Evaluates due by end of exam period.   |   |                      |

NOTE: Schedule subject to change with fair notice, check "Announcements" on Canvas for updates.  
Last updated: August 17, 2023

NOTE: Schedule subject to change with fair notice, check “Announcements” on Canvas for updates.  
Last updated: August 17, 2023

## References for Readings

- Abraham, J., Kannampallil, T., Brenner, C., Lopez, K. D., Almoosa, K. F., Patel, B., & Patel, V. L. (2016). Characterizing the structure and content of nurse handoffs: A Sequential Conversational Analysis approach. *Journal of Biomedical Informatics*, 59, 76-88.
- Arbaje, A. I., Hughes, A., Werner, N., Carl, K., Hohl, D., Jones, K., Bowles, K. H., Chan, K., Leff, B., & Gurses, A. P. (2019). Information management goals and process failures during home visits for middle-aged and older adults receiving skilled home healthcare services after hospital discharge: a multisite, qualitative study. *BMJ Qual Saf*, 28(2), 111-120. <https://doi.org/10.1136/bmjqs-2018-008163>
- Barton, H. J., Collier, R. J., Loganathar, S., Singhe, N., Ehlenbach, M. L., Katz, B., Warner, G., Kelly, M. M., & Werner, N. E. (2021). Medical Device Workarounds in Providing Care for Children With Medical Complexity in the Home. *Pediatrics*, 147(5). <https://doi.org/10.1542/peds.2020-019513>
- Berenholtz, S. M., Schumacher, K., Hayanga, A. J., Simon, M., Goeschel, C., Pronovost, P., Shanley, C. J., & Welsh, R. J. (2009). Implementing standardized operating room briefings and debriefings at a large regional medical center. *The Joint Commission Journal on Quality and Patient Safety*, 35(8), 391-397.
- Carayon, P., Hose, B.-Z., Wooldridge, A., Brazelton, T. B., Dean, S. M., Eithun, B. L., Kelly, M. M., Kohler, J. E., Ross, J., Rusy, D. A., & Hoonakker, P. L. T. (2022). Human-centered design of team health IT for pediatric trauma care transitions. *Int J Med Inform*, 162, 104727. <https://doi.org/https://doi.org/10.1016/j.ijmedinf.2022.104727>
- Carayon, P., Hundt, A. H., Karsh, B. T., Gurses, A. P., Alvarado, C. J., Smith, M. J., & Brennan, P. F. (2006). Work system design for patient safety: the SEIPS model. *Qual Saf Health Care*, 15 Suppl 1, i50-58. <https://doi.org/10.1136/qshc.2005.015842>
- Carayon, P., Karsh, B.-T., Gurses, A. P., Holden, R., Hoonakker, P., Hundt, A. S., Montague, E., Rodriguez, A. J., & Wetterneck, T. B. (2013). Macroergonomics in health care quality and patient safety. *Reviews of Human Factors and Ergonomics*, 8(1), 4-54. <https://doi.org/10.1177/1557234X13492976>
- Carayon, P., Wetterneck, T., Rivera-Rodriguez, A., Hundt, A., Hoonakker, P., Holden, R., & Gurses, A. (2014). Human factors systems approach to healthcare quality and patient safety. *Appl Ergon*, 45, 14-25. <https://doi.org/10.1016/j.apergo.2013.04.023>
- Carayon, P., Wooldridge, A., Hoonakker, P., Hundt, A. S., & Kelly, M. M. (2020). SEIPS 3.0: Human-centered design of the patient journey for patient safety. *Appl Ergon*, 84, 103033.
- Catchpole, K., Privette, A., Roberts, L., Alfred, M., Carter, B., Woltz, E., Wilson, D., & Crookes, B. (2022). A smartphone application for teamwork and communication in trauma: Pilot evaluation “in the Wild”. *Hum Factors*, 64(1), 143-158.
- Cox, E. D., Jacobsohn, G. C., Rajamanickam, V. P., Carayon, P., Kelly, M. M., Wetterneck, T. B., Rathouz, P. J., & Brown, R. L. (2017). A Family-Centered Rounds Checklist, Family Engagement, and Patient Safety: A Randomized Trial. *Pediatrics*, 139(5). <https://doi.org/10.1542/peds.2016-1688>
- Hallbeck, M. S., Lowndes, B. R., Bingener, J., Abdelrahman, A. M., Yu, D., Bartley, A., & Park, A. E. (2017). The impact of intraoperative microbreaks with exercises on surgeons: A multi-center cohort study. *Appl Ergon*, 60, 334-341. <https://doi.org/https://doi.org/10.1016/j.apergo.2016.12.006>
- Holden, R. J., Brown, R. L., Scanlon, M. C., Rivera, A. J., & Karsh, B.-T. (2015). Micro- and macroergonomic changes in mental workload and medication safety following the implementation of new health IT. *International Journal of Industrial Ergonomics*, 49, 131-143. <https://doi.org/https://doi.org/10.1016/j.ergon.2014.04.003>
- Holden, R. J., & Carayon, P. (2021). SEIPS 101 and seven simple SEIPS tools. *BMJ Quality & Safety*, bmjqs-2020-012538. <https://doi.org/10.1136/bmjqs-2020-012538>
- Holden, R. J., Carayon, P., Gurses, A. P., Hoonakker, P., Hundt, A. S., Ozok, A. A., & Rivera-Rodriguez, A. J. (2013). SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. *Ergonomics*, 56(11), 1669-1686. <https://doi.org/10.1080/00140139.2013.838643>
- Holman, G. T., Beasley, J. W., Karsh, B. T., Stone, J. A., Smith, P. D., & Wetterneck, T. B. (2016). The myth of standardized workflow in primary care. *Journal of the American Medical Informatics Association*, 23(1), 29-37. <https://doi.org/10.1093/jamia/ocv107>

NOTE: Schedule subject to change with fair notice, check “Announcements” on Canvas for updates.

Last updated: August 17, 2023

Fall 2023 – IE/EPsy 546

- Joseph, A., & Rashid, M. (2007). The architecture of safety: hospital design. *Current Opinion in Critical Care*, 13(6), 714-719.
- Lavender, S. A., Sommerich, C. M., Patterson, E. S., Sanders, E. B.-N., Evans, K. D., Park, S., Umar, R. Z. R., & Li, J. (2015). Hospital patient room design: The issues facing 23 occupational groups who work in medical/surgical patient rooms. *HERD: Health Environments Research & Design Journal*, 8(4), 98-114.
- Morrow, D. G., Lane, H. C., & Rogers, W. A. (2021). A Framework for Design of Conversational Agents to Support Health Self-Care for Older Adults. *Hum Factors*, 63(3), 369-378.  
<https://doi.org/10.1177/0018720820964085>
- Salwei, M. E., Carayon, P., Hoonakker, P. L. T., Hundt, A. S., Wiegmann, D., Pulia, M., & Patterson, B. W. (2021). Workflow integration analysis of a human factors-based clinical decision support in the emergency department. *Appl Ergon*, 97, 103498.  
<https://doi.org/https://doi.org/10.1016/j.apergo.2021.103498>
- Scanlon, M. C., Karsh, B.-T., & Densmore, E. M. (2006). Human Factors Engineering and Patient Safety. *Pediatric Clinics of North America*, 53(6), 1105-1119.  
<https://doi.org/https://doi.org/10.1016/j.pcl.2006.09.012>
- Temte, J. L., Beasley, J. W., Holden, R. J., Karsh, B.-T., Potter, B., Smith, P., & O'Halloran, P. (2020). Relationship between number of health problems addressed during a primary care patient visit and clinician workload. *Appl Ergon*, 84, 103035. <https://doi.org/https://doi.org/10.1016/j.apergo.2019.103035>
- Werner, N. E., Gurses, A. P., Leff, B., & Arbaje, A. I. (2016). Improving Care Transitions Across Healthcare Settings Through a Human Factors Approach. *J Healthc Qual*, 38(6), 328-343.  
<https://doi.org/10.1097/jhq.0000000000000025>
- Wickens, C. D., & Carswell, C. M. (2017). Information processing. *Handbook of human factors and ergonomics*, 117-161.
- Wooldridge, A. R., Carayon, P., Hoonakker, P., Hose, B.-Z., Schroeder, K., Brazelton, T., Eithun, B., Rusy, D., Ross, J., Kohler, J., Kelly, M. M., Dean, S., Springman, S., Rahal, R., & Gurses, A. P. (2022). Care transition of trauma patients: Processes with articulation work before and after handoff. *Appl Ergon*, 98, 103606. <https://doi.org/https://doi.org/10.1016/j.apergo.2021.103606>