Instructor: Dr. Priya Pennathur
Office Address: A 241 Engineering Building
Telephone: 915-747-7956
Office Hours: Mondays 3 pm – 5 PM or by appointment. My email is prpennathur2@utep.edu. I usually respond to emails within a day when I am in town, and during weekdays. It may take a bit longer when I am traveling, and during weekends.

Course Website: Blackboard

Meeting Times: Tuesdays from 6:00 PM – 8:50 PM
Location: Physical Science Building 222A

Course Description

This graduate course examines healthcare systems design with a human factors lens. Healthcare work involves complex, high consequence and high-risk goals requiring communication and coordination among many stakeholders, interaction with complex technologies and real-time decision-making. The course will include current research readings, in-class discussions on healthcare human factors, and a research project.

Course Goals

By the end of this course, you will learn about:
- A broad set of healthcare system issues examined from a human factors standpoint
- Tools and techniques for addressing human factors design challenges in healthcare systems

Course Topics

- Overview of Human Factors in Healthcare Systems
- Human Error and Patient Safety
- Conceptual Frameworks and Methods in Human Factors for Healthcare
- Health Information Technology
- Macroergonomics in Healthcare
- Physical Ergonomics and Physical Environment in Healthcare
- Job and Organization Design
- Teamwork in Healthcare
- Design and Evaluation of Healthcare Systems

Course Expectations

- Read and understand the research articles critically and reflectively.
- Participate and contribute to class discussions, by including your thoughtful ideas and opinions, with due respect for your peers’ ideas.
- Bring additional insights and opinions by sharing other resources, articles or ideas that you are aware of.
- Be open to other ideas, reflect on them, and challenge them constructively.
- Be punctual and courteous in attending the class sessions, and in submitting assignments on time.
Course Grade Assignments

- Reading Assignments and Participation in Class Discussions (35%)
- Online discussion (10%)
- Mid point presentation (5%) and Mid point paper (15%)
- Final paper (25%) and presentation (10%)

Description of Assignments

**Reading Assignments and Participation in Class Discussions (35%)**

The majority of class time will be spent in discussing research articles. Class discussions will help bring out varied perspectives on the research issues, as well as provide a forum for critically and thoughtfully thinking about the human factors challenges in healthcare.

There will be 2 components to every discussion:

1. Leading discussions for 3 articles in class and 1 online discussion.
2. Every student will read and prepare for discussion every class.

I will post discussion questions for every article on Blackboard couple of days prior to the assigned date for discussion.

There will be a discussion lead for each article. Each student is required to choose and lead 3 in-class discussions and 1 online discussion over the course of the semester. There will be a sign-up sheet provided to you for choosing the articles.

The discussion lead should be prepared to summarize the article, and facilitate discussion based on the questions I post in Blackboard. The discussion lead is expected to be ready with well-thought out responses for the discussion questions, any additional sources about the topic and facilitate peers to discuss the questions. Written response to the questions I post is not required. I will provide a discussion rubric first week of classes. This rubric will be used to grade your engagement in discussions.

For each article we will discuss in class that day, each student should complete and bring to class a written document (limit: one page) containing the following elements:

1. 2 to 3 sentence summary of each article (can be a bulleted list).
2. 2 interesting questions or thoughts that came to you while reading the article (can be a bulleted list).

This written sheet should be provided to me or uploaded on blackboard prior to beginning of class. The intent of this exercise is for you to read each article and prepare for discussion. You will be using this written sheet to guide your discussion.

We will spend approximately 25-30 minutes per article during class. You are encouraged to consult other external sources/readings as relevant to help steer the discussions.

The written document, generation of discussion questions and participation in discussions will all count towards your reading assignment and participation grade. A breakdown of grades for each category is shown below.

- Written document/summary = 5 pts per class session * 10 in-class sessions = 50 pts
- Leading discussions = 3 articles * 15 pts = 45 points
- Participation in discussion = 5 pts per class session * 10 in-class sessions = 50 points
Online Discussion (10%)

Each student will lead and moderate an online discussion of 1 reading assignment. Details will be provided closer to the assigned date.

Projects and Presentations

Each team will be assigned a project relevant to the healthcare and human factors area. More than half of the grade and time will be used for these projects. Specifics about the project will be provided in class. The project elements will generally include:

- Research Question or Problem (problem description will be provided to you)
- Human Factors background or literature review relevant to the problem
- Data collection methods
- Data analysis
- Findings and conclusions
- Discussion/Solutions/Interventions and Design Implications

Note that depending on the specifics and scope of the project opportunity, the structure will slightly vary. Once the project ideas are finalized, we will revisit the project elements.

Mid-point paper (15%)

Mid-point paper is a mechanism to help you complete most sections of the final project report mid-way through the project. The mid-point report should be about 20 double spaced pages in length (excluding figures, tables, references, appendices). **Mid-point paper is due on Oct 31st, 2023.** The mid-point report should include the following components:

Introduction/Problem Statement
Introduce the problem, setting, and your specific questions in this review. You should be addressing specific questions/gaps in your literature review. Provide the rationale for the study. Describe briefly what you will write in the rest of the paper (a mini map for what the readers can expect to see).

Literature Review Research Design and Methods
Describe your research design, any conceptual or theoretical frameworks you are using to conduct your literature search and review. Think of what you will search for, what you will include and exclude, and how you will filter your results, and how you will make sense of and synthesize your literature. Include references for the methods if any.

Sections reviewing the literature
The goal of the literature review section is to describe what is known about the topic in the field, what the current “gaps” are”, and what you are synthesizing from your review. The literature review should be comprehensive enough to cover the most important literature that is relevant to your study, but should be concise and focused enough to bring out the significance of your questions.

References – include your citations

Appendix – any work in progress documents (like diagrams)
Mid-point presentation (5%)

Mid-point presentation should include the elements in the mid-point paper. Plan to present your work for about 20 minutes. There will be 5 minutes for questions. **Mid-point presentations will be held on Oct 31st, 2023.**

Final paper (25%)

Final paper should be in a publishable form and content, with approximately 25-30 double spaced pages. It is due by Dec 5th, 2023. No exceptions will be allowed.

Final paper should include all of the elements in the mid-point paper [will vary depending on the structure] and the following:

**Abstract:** Describe the major components of your project within 250 words. Include problem statement, brief rationale, methods used and findings.

**Findings/Conclusions:** Results from your study need to be described in this section. Describe statistics (for a quantitative study) and/or major themes (mostly qualitative) you obtained in the study. Describe what you conclude based on your review. Discuss future work.

**Discussion/Solutions/Interventions/Design Implications:** Depending on your project, you may have prototyped a new design or may suggest a new design for a system component; you may have new implications for how something ought to be designed based on the findings from your review; you may suggest new interventions or process changes in the system for improvement; these aspects need to be described in this section. Additionally, provide an interpretation of your results in terms of what it means in the real system. Answer the “so what?” question and tie the discussion to literature wherever appropriate.

The elements already in the mid-point paper should be revised/improved or updated based on feedback you obtained or change in your plans.

Final Presentation (10%)

**Final presentation will be held on Dec 5th, 2023.** Please plan a presentation for 30 minutes, with 10 minutes for questions.

Attendance

Regular attendance is expected. As the nature and format of the course requires interactive discussion, students are expected to attend all classes. Classes will begin on time. If there is a genuine need for absence, please contact Dr. Pennathur well in advance, and please inform your team of your absence.

Grading Scale

A: 91-100  
B: 81-90  
C: 71-80  
D: 61-70  
F: ≤ 60
## Tentative Class Schedule

<table>
<thead>
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<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment (due dates)</th>
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<tr>
<td>1</td>
<td>Aug 29th</td>
<td>Introduction, Basic overview of human factors in healthcare, Human Error and Patient Safety in Healthcare, Sign-up for reading assignment discussion lead, Form teams</td>
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<td><strong>Note:</strong> Leading Discussion Questions and Preparing Written Summaries Begin next week, Sep 5.</td>
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<td>2</td>
<td>Sep 5</td>
<td>Human Error and Patient Safety in Healthcare Discussion</td>
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<td>3</td>
<td>Sep 12</td>
<td>Conceptual Frameworks and Methods in Human Factors for Healthcare Discussion, Project Discussion</td>
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<td>4</td>
<td>Sep 19th</td>
<td>Conceptual Frameworks and Methods in Human Factors for Healthcare Discussion</td>
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<td>5</td>
<td>Sep 26</td>
<td>Physical Environment in Healthcare Online-discussion, Project: Team Meeting with Instructor I, Guest Lecture TBA</td>
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<tr>
<td>6</td>
<td>Oct 3rd</td>
<td>Macroergonomics in Healthcare Discussion</td>
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<td>7</td>
<td>Oct 10</td>
<td>Health Information Technology and Human Interaction Discussion</td>
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<td>8</td>
<td>Oct 17</td>
<td>Health Information Technology and Human Interaction Discussion</td>
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<td>9</td>
<td>Oct 24</td>
<td>Health Information Technology and Human Interaction Discussion</td>
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<td>10</td>
<td>Oct 31</td>
<td>Physical Ergonomics in Healthcare Online-discussion, Mid-point presentations, Guest Lecture TBA</td>
<td>Mid-point paper due, Mid-point presentations</td>
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<td>11</td>
<td>Nov 7</td>
<td>Teamwork in Healthcare Discussion</td>
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<td>12</td>
<td>Nov 14</td>
<td>Organizational Design: Online Discussion, Project: Team Meeting with Instructor II, Guest Lecture</td>
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<td>13</td>
<td>Nov 21</td>
<td>Trending Topics in Healthcare Human Factors</td>
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<tr>
<td>14</td>
<td>Nov 28</td>
<td>Trending Topics in Healthcare Human Factors</td>
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<tr>
<td>15</td>
<td>Dec 5</td>
<td>Final Presentations</td>
<td>Final presentations due and Final Report Due</td>
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### Reading Assignments (Articles/Links will be posted in Blackboard before first class)

Week 1 is Introductory Session. No readings or discussion questions are assigned for week 1. I will discuss and present summaries of main topics from the articles below for week 1.

**Week 1 (Aug 29th) (Pennathur)**

**Overview of HF in Healthcare and Patient Safety**


Schiff G, Shojania KG. Looking back on the history of patient safety: an opportunity to reflect and ponder future challenges. BMJ Qual Saf. Published online October 8, 2021:bmjqs-2021-014163. doi:10.1136/bmjqs-2021-014163

Additional articles: (not for discussion)


Human Error and Patient Safety in Healthcare


Cook et al., Operating at the Sharp End: The Human Factors of Complex Technical Work and its Implications for Patient Safety


Additional articles: (not for discussion)


**Note: Leading Discussion Questions and Preparing Written Summaries Begin.**

**Week 2 (Sep 5)**  
**Human Error and Patient Safety in Healthcare**


Croskerry, P. (2003). The Importance of Cognitive Errors in Diagnosis and Strategies to Minimize them, Academic Medicine, 78(8).


**Additional articles: (not for discussion)**


**Week 3 (Sep 12)**  
**Conceptual Frameworks and Methods in Human Factors**


**Additional articles: (not for discussion)**

Unertl et al., 2010. Traversing the many paths of workflow research: developing a conceptual framework of workflow terminology through a systematic literature review. *Journal of American Medical Informatics Association, 17*:265-273.


**Week 4 (Sep 19th)**

**Conceptual Frameworks and Methods in Human Factors**


Ulmer FF, Lutz AM, Müller F, Riva T, Bütkofer L, Greif R. Communication Patterns During Routine Patient Care in a Pediatric Intensive Care Unit: The Behavioral Impact of In Situ Simulation. 2021;00(00):7.


**Additional articles: (not for discussion)**


**Week 5 (Sep 26th) Online Discussion**

**Physical Environment and Healthcare Issues**


**Additional articles: (not for discussion)**

Henriksen et al., 2008. The role of the physical environment in crossing the quality chasm. The Joint Commission Journal on Quality and Patient Safety, 33(11).


**Week 6 (Oct 3rd)**

**Macroergonomics in Healthcare**


**Additional articles: (not for discussion)**


**Week 7 (Oct 10th)**

**Health Information Technology and Human Interaction**


Week 8 (Oct 17th)

Health Information Technology and Human Interaction


Additional articles: (not for discussion)


Week 9 (Oct 24)

Cognitive Aspects of Health Information Technologies


Additional articles: (not for discussion)


**Week 10 (Oct 31) Online Discussion**

**Physical Ergonomics and Healthcare Systems**


**Additional articles: (not for discussion)**


**Week 11 (Nov 7)**

**Teamwork in Healthcare**


**Additional articles: (not for discussion)**


Morey et al., 2002. Error reduction and performance improvement in the emergency department through formal teamwork training: evaluation results of the MedTeams project. Quality of Care, Health Services Research, 37(6).

Rosen et al., 2008. A measurement tool for simulation-based training in emergency medicine: The simulation module for assessment of resident targeted event responses (SMARTER) approach. Simulation in Healthcare, 3(3).

**Week 12 (Nov 14) Online Discussion**

**Job and Organizational Design in Healthcare Systems**


**Additional articles: (not for discussion)**


Hutter et al., 2006. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Annals of Surgery, 243*(6).


**Week 13 (Nov 21)**

**Trending Topics in Healthcare Human Factors**


**Additional articles: (not for discussion)**


Week 14 (Nov 28)

Trending Topics in Healthcare Human Factors


Additional articles


**Administrative Drops:**
At the discretion of the instructor, a student may be dropped from a course because of excessive absences, neglect or lack of effort. A grade of "W" will be assigned before the course drop deadline and a grade of "F" after the course drop deadline. A grade of “F” received due to disciplinary action imposed by the University overrides a grade of "W" received through a student-initiated or faculty drop.

**Class Attendance:**
The student is expected to attend all class sessions. It is the responsibility of the student to inform each instructor of extended absences. When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, a drop for not attending will count toward the State Allowed Six Drop Limit. If you are failing the class at the time of the drop you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid and other programs. As per UTEP rules, you may be asked to show a UTEP ID at any time during class.

**Excused Absences for University-Recognized Activities:**
Students who will be absent while representing the University in officially recognized University activities (sports, band, professional conferences, etc.) must notify the Dean of Students not less than ten (10) days prior to the absence. The Dean of Students will provide the student with a letter of excuse for the professors. It is the student’s responsibility to give the letter to the professors prior to the official recognized activity. Students following these procedures will be permitted to make up both assignments and examinations in consultation with faculty.

**Students With Disabilities:**
If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at https://www.utep.edu/student-affairs/cass/.

**Academic Integrity:**
The University of Texas at El Paso prides itself on its standards of academic excellence. In all matters of intellectual pursuit, UTEP faculty and students must strive to achieve excellence based on the quality of work produced by the individual. In the classroom and in all other academic activities, students are expected to uphold the highest standards of academic integrity. Any form of academic dishonesty is an affront to the pursuit of knowledge and jeopardizes the quality of the degree awarded to all graduates of UTEP.

Any student who commits an act of academic dishonesty is subject to discipline. Academic dishonesty includes, and is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another
person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP), and available in the Office of Student Life and on the homepage of the Office of Student Life at www.utep.edu/dos, can result in sanctions ranging from disciplinary probation, to a failing grade on the work in question, to a failing grade in the course, to suspension or dismissal, among others.

Engineers are educated professionals, and every engineer is expected to subscribe to a professional canon of ethics. Paramount among these is the canon that engineers shall not affix their signatures to documents that are not their own work. This is also expected of engineering students, whether or not the work is being graded individually or as a group! If academic dishonesty is suspected or observed, please report it to the instructor -- this will be kept in the strictest confidence.

- If you are suspected of scholastic dishonesty you may not be directly confronted about your conduct by the instructor or proctor. You will however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) and your exam will not be admissible. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes or graduation.

- If you miss more than one exam, the instructor may choose to administratively drop you from the class. This may adversely impact a visa and financial aid.

- Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.