



CSYE 7374 User Experience Design for Healthcare Applications

Course Information

Course Title: User Experience Design for Healthcare Applications

Course Number: CSYE 7374

Term and Year: Spring 2024

Credit Hour: 4

Course Format: Live-cast

Class schedule: Wednesdays 12 - 3pm EST

Instructor Information

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Course Prerequisites

CSYE7280 or a similar general UX/HCI course; good working knowledge of Design Principles, User Experience Research & Design, and User Experience testing concepts.

Course Description

Health IT presents a very complex systems engineering challenge for environments where some technologies are highly regulated (e.g. medical devices), while other technologies are not (e.g. software). User experience for healthcare applications extends beyond satisfaction and efficiency to include safety - ensuring that people will not die as a result of poor UX design. The UX challenge is to inform design of the needs of a variety of stakeholders in clinical and non-clinical settings: across hospitals, homecare environments and on the move while using mobile healthcare technology. In addition, factors related to regulation, organizational culture and political climate in healthcare, also influence technology implementation and adoption.

This course introduces the unique challenges of UX research, design and evaluation in a complex safety-critical domain, with a systems engineering perspective. Informs of regulations, standards, development processes, implementation and adoption considerations for health technology. This course will prepare students for the challenges UX professionals need to tackle when working on healthcare applications. Offers students an opportunity to build the necessary skill sets to enter the competitive and highly specialized industry of healthcare IT.

Standard Learning Outcomes

Learning outcomes common to all College of Engineering Graduate programs:

1. *An ability to identify, formulate, and solve complex engineering problems.*

2. *An ability to explain and apply engineering design principles, as appropriate to the program's educational objectives.*
3. *An ability to produce solutions that meet specified end-user needs with consideration of public health, regulations, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*

The Information Systems Program accepts students of different engineering backgrounds with minimum programming skills and produces first class Information Systems engineers that operate at the intersection of real-world complexity, software development, and IT management. Graduating students will be able to construct end-to-end advanced software applications that meet business needs.

Specific Learning Outcomes for the Information Systems program:

1. *Create a strong technical foundation through diverse, high-level courses*
2. *Build crucial interpersonal skills needed to succeed in any industry*
3. *Foster a deep level of applied learning through project-based case studies*

Required Tools and Course Textbooks.

The readings associated with each weeks topics are mandatory. Students are expected to read the assigned chapters in articles in advance of each lecture. Students will need access to the full text of the following books:

1. **Book 1** - *Fieldwork for Healthcare: Guidance for Investigating Human Factors in Computing Systems*. Morgan & Claypool, 2015, Furniss, Dominic., et al., editors.
2. **Book 2** - *Fieldwork for Healthcare: Case Studies Investigating Human Factors in Computing Systems*. Morgan & Claypool, 2014, Furniss, Dominic., et al.
3. **Book 3** - *Design for Health: Applications of Human Factors*. Academic Press, 2020, Sethumadhavan, Arathi, and Farzan Sasangohar, editors.

Course Schedule

Week	Topics	Readings
WEEK1 Jan. 10	Meet and greet the students and professor; overview of course and policies Topics: UX vs. Healthcare UX, Types of Health IT	-----
WEEK 2 Jan. 17	Topics: UX methods refresher, Overview UX in healthcare, Systems thinking, Case study <i>In-class exercise</i>	Book 3 – Chapter 3 Reading articles (TBA)
WEEK 3 Jan. 24	Topics: Patient Safety, Incident Investigations, Root Cause Analysis <i>In-class exercise</i> <i>Assignment 1 given out</i>	Book 3 – Chapter 1 and Chapter 2 Canadian Incident Analysis Framework London Protocol
WEEK 4 Jan. 31	Topics: Overview of health IT classification and Regulation <i>In-class exercise</i> <i>Assignment 2 given out</i>	Reading articles (TBA)
WEEK 5 Feb. 7	Topics: UX Regulations and Standards for Medical Devices around the world incl. FDA, Health Canada, EU CE <i>In-class exercise</i> <i>Assignment 3 given out</i>	Medical Device Design and Regulation Medical Device Quality Management Systems
WEEK 6 Feb. 14	Exam 1	
WEEK 7 Feb. 21	Topics: UX regulations for Software <i>In-class exercise</i>	Book 3 – (Chapter 4) and Chapter 5 Healthcare IT Standards Usability Guidelines
WEEK 8 Feb. 28	Topics: Practical challenges of doing UX engineering in healthcare, Ethics, Access, Impact, Case studies	Book 1: Chapter 1 and Chapter 6

	<i>In-class exercise</i> <i>Assignment 4 given out</i>	Book 2: Chapter 4 NIH consent writing document
SPRING BREAK March 6	No classes	
WEEK 9 March 13	Topics: Communication in healthcare and implications for UX design; Case study <i>In-class exercise</i> <i>Assignment 5 given out</i>	Book 3 – Chapter 6
WEEK 10 March 20	Topics: Intricacies of UX Health, Health IT Procurement and Implementation	Book 1 - Chapter 3 and Chapter 4 Book 2 - Chapter 1, Chapter 7
WEEK 11 March 27	Exam 2 Overview of work for the rest of the semester <i>In-class student team formation and topic selection</i>	
STUDENT PRESENTATIONS		
WEEK 12-14 Apr. 3, 10,17	Topics: 1. various topics researched and presented in teams 2. Guest speaker	Book 2 – various chapters Book 3 – various chapters
Week 15 Apr. 24	Exam 3 Topics: Beyond healthcare: Case study from aviation	

Grading

In-class exercises	35%
Three exams	35%
Assignments	15%
In-class Presentation	15 %

Plagiarism Policy

When there is evidence that a student has committed plagiarism, copied the work of others, allowed others to copy their work, cheated on an exam, altered class material or scores, or has inappropriate

possession of exams, or sensitive material, the incident will be investigated. The consequences for academic dishonesty are severe and that will include a straight F in the course with the potential for dismissal.

The following rules apply to anything you hand in for a grade:

- You may not copy anyone else's work under any circumstances - this includes online and AI sources.
- You may not use any automated or AI tools to generate your assignments or any other material that you're turning in for a grade, in whole or in part, unless an assignment specifically allows you to use these tools.
- You may not permit any other student to see any part of your individual assignments.
- You may not permit yourself to see any part of another student's individual assignment.
- You may use online resources as part of your coursework but you may not copy from online sources. If you get an idea of how to solve a problem from an online source, include a short citation in your submission.
- Use of AI resources and posting on forums is not permitted.
- The only exception to the above rules is that you may collaborate with students in your group for assignments classed as group assignment - almost all labs for example will be completed in groups.

Attendance policy

The department has a strict class attendance policy. Students who miss two or more Classes will automatically receive one letter grade lower in their final grade. Students who miss three Classes will receive an automatic F for the class. No exceptions are allowed for this rule, unless proof of extenuating circumstances is provided and faculty must be notified in advance.

Students are expected to complete course readings, participate in class discussions or other learning activities during the unit, and complete written assignments for each unit during the time of that unit.

Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Work submitted late will not be graded.

End-of-Course Evaluation Surveys

Your feedback regarding your educational experience in this class is particularly important to the College of Professional Studies. Your comments will make a difference in the future planning and presentation of our curriculum.

At the end of this course, please take the time to complete the evaluation survey at <https://neu.evaluationkit.com>. Your survey responses are **completely anonymous and confidential**. For courses 6 weeks in length or shorter, surveys will be open one week prior to the end of the courses; for courses greater than 6 weeks in length, surveys will be open for two weeks. An email will be sent to your Husky Mail account notifying you when surveys are available.

Academic Integrity

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to <http://www.northeastern.edu/osccr/academic-integrity-policy/> to access the full academic integrity policy.

University Health and Counseling Services

As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit <https://www.northeastern.edu/uhrs>.

Student Accommodations

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit <https://drc.sites.northeastern.edu>.

Library Services

The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit <https://library.northeastern.edu>.

24/7 Canvas Technical Help

For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Faculty Resources: <https://canvas.northeastern.edu/faculty-resources/>

Canvas Student Resources: <https://canvas.northeastern.edu/student-resources/>

For assistance with my Northeastern e-mail, and basic technical support:

Visit ITS at <https://its.northeastern.edu>

Email: help@northeastern.edu

ITS Customer Service Desk: 617-373-4357

Diversity and Inclusion

Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit <http://www.northeastern.edu/oidi/> for complete information on Diversity and Inclusion

Title IX

Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

Please visit <https://www.northeastern.edu/ouec> for a complete list of reporting options and resources both on- and off-campus.