Northeastern College of Engineering

[CSYE 7280 User Experience Design and Testing]
[FALL 2024]

Course Information
Course Title: User Experience Design and Testing
Course Number: CSYE 7280
Term and Year: FALL 2024
Credit Hour: 4
CRN: 22205
Course Format: Traditional

Instructor Information
Full Name: Arya Babaei
Email Address: Dr.arya.business@gmail.com
Office Hours: Saturdays 10-13

Instructor Biography
With a decade of global academic and scholarly experience, Arya specializes in Innovation, Design Thinking, and Prototyping. He excels at creating inventive curriculum and guiding students through innovative pedagogy, gamified approach, and experiential labs. Also, in domain of research initiatives his primary emphasis is on Human Computer Interaction and Dynamic Software Design. This includes the integration of UCD, cognitive science, behavioral analysis, and psychographic mapping. Additionally, drawing on over 15 years of expertise in leading product design and user research at top-tier companies such as KPMG, Accenture, Meta, Amazon, HSBC, Deutsche Bank, and innovation hubs like the Polytechnic University of Milan, Arya has successfully managed more than 25 projects globally.ef instructor biography here.

Teaching Assistant Information
Full Name: Arya Babaei
Email Address:-
Office Hours:Saturdays 10-13

Course Prerequisites
Graduate level INFO 5100 Minimum Grade of B- or Graduate level CSYE 6200 Minimum Grade of B-
Course **Description**
his course focuses on user experience and advanced interaction concepts through Web and mobile app design projects, with an emphasis on human-centered design and design thinking. It equips students with essential skills to make informed decisions in crafting modern websites and mobile apps that fulfill user needs. The course incorporates usability and interview techniques to understand user requirements, ensuring that user experience is central to the design process.

In mobile app design, the course emphasizes creating intuitive and efficient in-app experiences for handheld devices. This involves addressing specific user needs and constraints, such as accessibility, discoverability, and efficiency, to optimize on-the-go interactions. Students learn to develop wireframes, advanced prototypes, and user scenarios, applying human-centered design principles that focus on empathy and understanding users' pain points.

Design thinking complements this approach by fostering creativity and innovation, encouraging students to explore diverse perspectives and iterate on solutions through prototyping and testing. The course includes case studies on information architecture and software engineering usability, discussed in team settings to highlight user perspectives and apply a systems approach.

Usability testing is a critical component of the course. Students learn to conduct usability tests by creating realistic task scenarios, facilitating test sessions, and analyzing the results to identify usability issues. This process helps ensure that both web and mobile designs are intuitive, user-friendly, and meet user expectations. The course also covers mobile-specific UX challenges, such as screen optimization, performance, and error handling, ensuring that apps provide value to users.

By integrating software quality assurance and usability testing, the course ensures that both web and mobile designs are validated and meet user acceptance. This iterative process aligns with human-centered design's emphasis on prototyping and refining solutions to truly meet users' needs. Regular usability testing not only helps in identifying design flaws early but also ensures that the app remains relevant and effective in meeting user needs over time.

Course Learning Outcomes
Learning Outcomes for the Course

- Ability to Design User-Centric Interfaces: Students will be able to apply human-centered design principles to create intuitive and efficient interfaces for both web and mobile applications, ensuring that user experience is central to the design process.
- Proficiency in Usability Testing: Students will develop the skills necessary to conduct comprehensive usability testing, enabling them to gather feedback, identify usability issues, and make data-driven decisions to enhance user experience.
- Application of Design Thinking: Students will be able to employ design thinking methodologies to foster creativity and innovation, exploring diverse perspectives and iterating on solutions through prototyping and testing.

Specific Learning Outcomes for the Course

- Development of Advanced Prototypes: Students will learn to create wireframes and advanced prototypes, applying empathy and understanding of user pain points to design solutions that meet specific user needs and constraints, such as accessibility and efficiency.
- Execution of Real-World Usability Tests: Students will gain hands-on experience in conducting usability tests by creating realistic task scenarios, facilitating test sessions, and analyzing results to ensure web and mobile designs are user-friendly and meet expectations.
- Addressing Mobile-Specific UX Challenges: Students will acquire the ability to tackle mobile-specific UX challenges, such as screen optimization, performance, and error handling, ensuring that mobile apps provide value and meet user needs effectively.

Required Tools and Course Textbooks.
Recommended Articles:

1) https://www.linkedin.com/pulse/behavioral-based-interface-design-incorporate-data-arya-gwd8f/

2) https://www.linkedin.com/pulse/from-neurons-norms-holistic-approach-human-experience-arya-fsfff/

3) https://www.linkedin.com/pulse/science-user-experience-cognitive-insights-usability-arya-ceh7f/

4) https://www.linkedin.com/pulse/2024s-ux-revolution-embracing-innovation-design-arya-09lgf/

5) https://www.linkedin.com/pulse/ideation-instincts-cultivating-creativity-from-dr-arya-fuvtf/

6) https://www.linkedin.com/pulse/customer-experience-puzzle-exploring-surveys-babaei-phd-mba-mdes-ykf2e/

7) https://www.linkedin.com/pulse/empathy-agility-dynamic-duo-product-management-dr-arya-5xeaf/

8) https://www.linkedin.com/pulse/strategies-objective-observation-non-verbal-cues-user-dr-arya-48dbf/

9) https://www.linkedin.com/pulse/from-ideas-systems-journey-through-design-driven-dr-arya-sctwc/

10) https://www.linkedin.com/pulse/language-innovation-discourse-exploring-designs-dr-arya-cccuf/

11) https://www.linkedin.com/pulse/hcd-principles-hci-boundaries-web-design-overview-dr-arya/

12) https://www.linkedin.com/pulse/unveiling-accessibility-understanding-wcag-addressing-arya/

13) https://www.linkedin.com/pulse/strategic-fusion-power-xr-ai-synergy-innovative-dr-arya-m4brf/?trackingId=vWyUB521S9qFfCpozSbrOg%3D%3D

14) https://medium.com/@dr.arya.design/the-evolution-of-reality-exploring-the-realm-of-ar-vr-and-xr-f4c14178df73

Recommended videos:

1) Got a Wicked Problem? First, Tell Me How You Make Toast by Tom Wujec

   a. Tom Wujec presents a simple design exercise that reveals unexpected truths about how we think and approach problem-solving. Watch here.

2) Simplicity Sells by David Pogue

   a. David Pogue discusses the importance of simplicity in design and highlights common user interface blunders, coining the term "software rage." Watch here.

3) The First Secret of Design is... Noticing by Tony Fadell

   a. Tony Fadell shares insights on how observing the world can lead to better design solutions, emphasizing the importance of noticing small details. Watch here.

4) The Art of Asking by Amanda Palmer

   a. Amanda Palmer discusses the importance of connection and communication in design, emphasizing how understanding user needs can lead to better product experiences. Watch here.

5) How Giant Websites Design for You (and a Billion Others, Too) by Margaret Gould Stewart

   a. Margaret Gould Stewart discusses the challenges and strategies of designing user experiences for massive audiences, using real-world examples. Watch here.

6) How Airbnb Designs for Trust by Joe Gebbia

   a. Joe Gebbia shares the story of Airbnb's design journey and how they create user interfaces that foster trust among users. Watch here.

7) Designing for All 5 Senses by Jinsop Lee

   a. Jinsop Lee advocates for creating products that engage all five human senses, enhancing the overall user experience. Watch here.

8) The Human-Computer Interface Revolution by John Underkoffler

   a. John Under Koffler discusses the evolution of human-computer interfaces and envisions a future where intuitive interfaces enhance user interaction. Watch here.

9) The Power of Design to Improve Life by Tim Brown

   a. Tim Brown discusses how design thinking can be a powerful tool for addressing complex challenges and improving lives. Watch here.

10) The Future of Human-Computer Interaction by Pattie Maes

   a. Pattie Maes explores cutting-edge developments in HCI and how they can transform the way we interact with technology. Watch here.

11) How to Build Your Creative Confidence by David Kelley

   a. David Kelley discusses the importance of creativity in design and how to foster confidence in your creative abilities. Watch here.

12) The Creative Power of Design Thinking by Tim Brown

   a. Tim Brown explores how design thinking can be used as a powerful tool for innovation and problem-solving across various fields. Watch here.

Course Schedule/Topics Covered. Please insert what is applicable for your class using the below table. See sample provided below and adjust according to your schedule

Week	Date	In Class Topic	Assignment Due (Before our Weekly Class)
1	09/04	• Introduction to User Experience and Human Factor in Design • Understanding Design Thinking as a problem-solving methodology • From wicked problem to Tame problem (Problem Chain) • Product Vision & Value proposition *Complementary Lessons* • Introduction to creative diagraming in design domain • Using Brainwriting For Rapid Idea Generation (Affinity Map) • Introduction to Value Proposition and Product Vision • Introduction to Miro platform *Class Activity* • Group formation, sector selection, assigning problem to be solved, selecting diversified Target Audeience • Hands-On Practice in Story and Experience Exploration *Deliverable (0.A)* • Analyzing selected mobile map	
2	09/11	• Importance of empathizing and starting from the stories • Understanding user pains, concerns, desires and needs • Discussion about Dialogue-driven interviews with open-ended questions • The Quadrant Approach: Integrating Story, Persona, Empathy Map, and Journey Map *Complementary Lessons* • Introduction to qualitative research and open-ended questioning • What is business scenario in product design • Introduction to Software development procedures • Introduction to System thinking and Divergent thinking *Class Activity* • Games to needs and openins exploration, creating personas and diversifying them. • Peer 2 Peer Interview • Develop Business Scenario for jourey mapping	**Deliverable (0.A)**

		Deliverable (0.B) • Interview Notes and Hand written draft of S.P.E.J	
3	09/18	• How Inteprated Intervieews (color coding and thematic analysis) • Persona, Empathy map, and Journey map artifacts • Interconnection between personas and empathy maps • Examples of empathy maps and journey maps in various sectors *Complementary Lessons* • Lessons on creating business reports & artifact reporting. • Benchmarking competitors in product-driven approach • Scenario-Driven Problem exploration • Reviewing First Deliverable *Class Activity* • Games on creating customer journeys *Deliverable (1)* • Report 1: Story's affinity map, Persona, Empathy Map,Journey Map	**Deliverable (0.B)**
4	09/25	• Defining problem: crafting problem statements >5W 1H • Importance of root cause analysis and 5why technique • Cohesion between empathizing and defining phases. *Complementary Lessons* • Crafting comprehensive problem statements • Introudction to Agile Software Developoemnt & SDLC • Product Driven Competitive Analysis (Market Perspective) *Class Activity* • Games on Root-Casuse Analysis *Deliverable (0.C)* • Debate 1 (On Problem Roots) • Draft of Market Insights & competitor Benchmarking	**Deliverable (1)**
5	10/2	• Problem Priortization (Severity vs Impact) • 9 Position on Demand vs Gaps in eco-system : Epic Level • Survey Based Priortization	**Deliverable (0.C)**

		Complementary Lessons • Introduction to Segmentation and Product Market Fit *Class Activity* • Games on Software Positioning in eco-system *Deliverable (2)* • Report 2: Empathizing (Persona, Empathy Map, journey Map) + Demand Insights & Product Driven Benchmarking + Define (Problem Statement & Prioritzation) + Debate 1	
6	10/9	• Ideation process and possible areas for ideation • RWA and Scamper for enhancing ideation quality. • Ideation across Customer Experience (CX) *Complementary Lessons* • Introduction to Attribution Modelling *Class Activity* • Game on Scamper • Presentation of the second report *Deliverable (0.D)* • Scamper Table • Innovative Journey Map	**Deliverable (2)**
7	10/16	• Ideation leading to innovation. • Ideation in the context of Digital Transformation and Technology • Understanding Tech use cases and idea statements • Prioritizing ideas and ideation VDF & Kano *Complementary Lessons* • Introduction to Open Innovation • Design-Driven Innovation *Class Activity* • Games on making idea statements and introduction to tech-driven research and innovation. *Deliverable (3)* • Report 3: Empathizing (Persona, Empathy Map+Journey Map) + Demand Insights & Product Driven Benchmarking + Define (Problem Statement & Prioritzation) + Ideation (Scamper, Ideation in CX, Tech Ideation) + Debate 2	**Deliverable (0.D)**
8	10/23	• Mid-Term Presentation (Product Vision hybridized with Innovation) + Idea Pitch	**Deliverable (3)**
9	10/30	• Prototyping and introduction to Figma • Types of prototyping and tangible artifacts	

		• Introduction to MVP and product decomposition • User Stories, user flow and navigation • Introduction to Low-Mid Fidelity *Complementary Lessons* • Games on creating design kits and brand kits. • Exploring generative AI for prototyping • Introduction to UI Concept *Class Activity* • Low-Fidelity Hand Sketching incorporating Ideas *Deliverable (0.E)* • Product Decomposition + MVp: User stories + User Flows + Visual Map + Low Fidelity Sketches	
10	11/6	• High fidelity prototyping and clickable prototypes. • Presenting tech-driven and CX-driven ideas in prototypes • UI Package and Design Systems *Complementary Lessons* • Working on prototypes and clickable prototypes in Figma • Understanding idea pitch and making impactful pitches *Class Activity* • Working on prototypes and clickable prototypes in Figma & WIX *Deliverable (4)* • Report 4: Product Decomposition + MVp: User stories + User Flows + Visual Map + Low Fidelity Sketches + Clickable Prototype + UI Kit	**Deliverable (0.E)**
11	11/13	• Introduction to writing testing proposals • A/B testing and using clickable prototype for testing. • 11 Essential UX Laws *Complementary Lessons* • Introduction to software testing *Class Activity* • Working on testing plans *Deliverable (0.F)* • Scenario Driven Test cases on Performance (Time) • A/B Testing Report and Recommendations for Improvement	**Deliverable (4)**
12	11/20	• Metrics & KPI in Usability Testing	**Deliverable (0.F)**

		- Introduction to Usability Heuristic *Complementary Lessons* - Introduction to Cognitive Science in usability *Class Activity* - Game on Usabilty Test Case *Deliverable (5)* A/B Testing Report + Usability Heuristic Report + Solutions	
13	11/27	- Innovation is about Feedback loop and Continuous Improvement - Open innovation & Partnership Plan *Deliverable* - Final Pitch on Finlized Product/Digital Platform	**Deliverable (5)**
14	**12/4**	Final Presentation (Innox Trade Fair)	**Final Presenatation**
15	12/11	Grading	

Assignment Grading

- Business Reports 50% (Report 1 to 5)
- Team Debates 10% (Problem Statement & Ideation)
- Midterm Project Presentation 10% (First Pitch on Product Vission)
- Final Project 20% (Final Product + Usabilty Results)
- Creativity and Class Participation 10%

Grading Scale

	87-89.9% B+	77-79.9% C+	
95-100% A	84-86.9% B	74-76.9% C	
90-94.9% A-	80-83.9%B-	70-73.9% C-	69.9% or below F

Attendance/Late Work Policy

Attendance Policy

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed **a maximum of 2 absences per course, with 3 or more absences resulting in an automatic 'F' for that course.** Students are expected to inform their instructors of any absences in advance of the class; if a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor (coe-mgen-gradadvising@northeastern.edu) to learn more

about the Medical Leave of Absence. Should a student anticipate being unable to attend 3 or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave in accordance with the University's academic and global entry expectations. International students should review the Office of Global Services webpage to understand their visa compliance requirements.

Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

Late Work Policy

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty prior to the deadline if they anticipate work will be submitted late. Work submitted late without prior communication with faculty 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 Engineering. 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 Northeastern University 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.

MGEN Student Feedback
Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey: https://neu.co1.qualtrics.com/jfe/form/SV_cTlAbH7ZRaaw0Ki

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/uhcs.

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
Network Campus Library Services: Northeastern University Library Global Campus Portals

24/7 Canvas Technical Help
For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

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.*