Syllabus: Cognitive Systems Engineering Capstone

Course Title: PSY 478: Cognitive Systems Engineering Capstone

Semester: Fall 2024

Instructor: Dr. Emily Zhao

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Office Hours: Tuesdays 2:00-4:30 PM OR by appointment

Class Time & Place: Monday or Wednesday 2:00-3:15 PM in SANCA 152

Course Description:

This course explores the principles and practices of Cognitive Systems Engineering (CSE) with a particular focus on human-automation interaction, decision-making processes, and the design of complex socio-technical systems. Students will select a project topic within the realm of CSE, develop a detailed proposal, conduct original research or implement a practical project, and present their findings through a comprehensive report, a poster presentation, and an elevator pitch...

The course is designed to integrate theoretical knowledge with practical application, allowing students to apply what they have learned in previous coursework to solve real-world problems in human systems engineering. The capstone project will require students to demonstrate critical thinking, project management skills, and the ability to communicate their findings effectively.

Course Objectives:

By the end of this course, students will be expected to:

1. Conduct an in-depth cognitive systems engineering project that addresses a current challenge in human-automation interaction or decision support systems.

2. Develop a well-structured project proposal, incorporating a timeline, methodology, and expected outcomes.

3. Produce a final report that critically evaluates the project's success, including a discussion of challenges faced and lessons learned.

4. Present their project through a professional-quality poster and a succinct, persuasive elevator pitch at the Innovation Showcase.

Learning Outcomes:

Upon successful completion of this course, students will:

1. Gain a thorough understanding of cognitive systems engineering and its applications in various domains such as healthcare, aviation, and autonomous systems.

2. Develop hands-on experience in designing, conducting, and analyzing research or applied projects in cognitive systems engineering.

3. Enhance their skills in technical writing, oral presentations, and professional communication, preparing them for future careers in human systems engineering or related fields.

4. Improve their ability to work independently and as part of a team to solve complex engineering problems.

Course Requirements:

Prerequisites: Senior standing in Human Systems Engineering or instructor approval.

Materials: No textbook is required; readings and resources will be provided based on project needs. Access to a computer with design and data analysis software (e.g., MATLAB, SPSS) may be necessary depending on the chosen project.

Class Structure:

This course will consist of a combination of classroom sessions, one-on-one meetings with the instructor, and independent project work. Class meetings will be held on designated Mondays or Wednesdays, focusing on project development, peer feedback, and professional skill-building. Individual meetings will provide personalized guidance and feedback on project progress.

Evaluation:

Class meetings (5): 20 points

- Participation in discussions, project updates, and group activities.

Individual meetings (3): 12 points

- Scheduled consultations to discuss project development and receive feedback.

Project Proposal: 10 points

- Initial submission outlining the project's objectives, methodology, and timeline.

Revised Proposal: 13 points

- Revised based on feedback, with more detailed planning and adjustments.

Final Report: 25 points

- A comprehensive document detailing the project from conception to conclusion, including analysis

and reflection.

Presentation: 10 points

- A 2-minute elevator pitch summarizing the project's key points.

Poster: 10 points

- A visually appealing and informative poster for the Innovation Showcase.

Total: 100 points

Grading Scale:

A = 90-100

B = 80-89

C = 70-79

D = 60-69

E = <60

Note: Grades will be rounded according to standard rules (e.g., 89.5 will round up to 90).

Course Policies:

Attendance and Participation: Regular attendance and active participation are crucial for success in this course. Students are expected to attend all scheduled class meetings and individual sessions. If a student is unable to attend a class, they should inform the instructor in advance and arrange to complete any missed work.

Academic Integrity: All students must adhere to ASU's academic integrity policy. Any form of academic dishonesty, including plagiarism, will be reported and may result in severe penalties, including a failing grade for the course.

Accommodations: Students with disabilities or special needs should contact the ASU Disability Resource Center to arrange appropriate accommodations and notify the instructor as soon as possible.

Important Dates:

Class Week 1: Introductions & Project Brainstorming (Aug 26)

Individual Meeting #1: Discuss Ideas and Readings (Sep 4)

Class Week 2: Proposal Presentation & Group Feedback (Sep 18)

Individual Meeting #2: Proposal Feedback & Methods Discussion (Oct 2)

Class Week 3: Revised Proposal Presentation & CERTT Tour (Oct 23)

Individual Meeting #3: Data Analysis & Progress Review (Nov 13)

Class Week 4: Professional Development & Project Discussion (Nov 27)

Innovation Showcase: Final Presentations & Poster Display (Dec 6)