Course Syllabus

CPSC 8740: AI-Receptive Software Engineering

Fall 2024

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Course Description

Designed to be accessible as an entry-level course in modern software development principles, this course embraces the potential for strategic integration and appropriate use of AI tools to enhance operational efficiency of the development process without compromising quality or safety. Emphasis is also placed on human-centered design, ensuring an enhanced user experience both during development and post development of software technology.

Prerequisites

Proficiency in at least one modern programming language (e.g., Python, Java, C#, C/C++). Knowledge of development tools (e.g., make, git) is beneficial as is familiarity with HTML, CSS, and JavaScript for comprehending how AI can be integrated into web-based applications.

Learning Objectives

After completing this course, you will be able to:

- Integrate various AI tools into software projects, enhancing functionality and user interaction while maintaining a focus on ease of use and accessibility.
- Critically evaluate the ethical implications of using AI in software development, including issues related to privacy, data security, and algorithmic bias.
- Employ human-centered design principles in the development of software, ensuring that user needs and experiences are at the forefront of the development process.
- Design and implement AI-enhanced software solutions that prioritize user needs, preferences, and values, demonstrating a deep comprehension of how AI can enhance user experience.
- Conduct a thorough analysis of existing AI applications in software development, identifying strengths, weaknesses, and areas for improvement in terms of user-centered design.
- Effectively communicate their AI software development projects, articulating the design process, implementation details, and user-centric considerations through clear and engaging presentations.

Required Materials

No required materials, all materials will be provided through the course.

Your Well-being is Important

As a student you may experience a range of personal issues that can impede learning, such as strained relationships, increased anxiety, alcohol/drug concerns, feeling down, sadness, difficulty concentrating, lack of motivation, or other issues. These mental health concerns may impact your academic performance or your participation in daily activities. It is very important that you ask for help when you are struggling. Please reach out to me or to Clemson's mental health services to guide you to resources that will help.

Topical Outline

- Introduction to Human-Centered Development
- Exploring AI Tools in Software Development
- Fundamentals of UX Design with AI
- Personalizing UX with AI
- Collaboration in Software Development + AI
- Ethical Considerations of AI in Software Development
- Historical Perspectives on Software Development

Major Assessment/Grading Activities

Grading System

Letter	Points/Percentages
A	>= 90
B	89.99… to 80
C	79.99… to 70
F	69.99… to 0

Grading Policies
Grades will be maintained on Canvas/Coursera. Students are responsible for tracking their progress through the online gradebook.

Absences

As per Clemson academic policy, course instructors may use *reasonable* academic penalties which reflect the importance of work missed due to unexcused absences, since absence from class is detrimental to the learning process. Course instructors who penalize students for unexcused absences must state attendance requirements as related to the grading, on the course syllabus and keep accurate attendance records. See the Academic Regulations section of the current Undergraduate catalog or the Policies and Procedures of the Graduate catalog, both located at the Course Catalog home page.

Notification of Absence

The **Notification of Absence module in Canvas** allows students to quickly notify instructors (via an email) of an absence from class and provides for the following categories: court attendance, death of immediate family member, illness, illness of family member, injury, military duty, religious observance, scheduled surgery, university function, unscheduled hospitalization, other anticipated absence, or other unanticipated absence.

The notification form requires a brief explanation, dates and times. Based on the dates and times indicated, instructors are automatically selected, but students may decide which instructors will receive the notification. This does not serve as an "excuse" from class. It is a request for an excused absence and students are encouraged to discuss the absence with instructors, as the instructor is the only person who can excuse an absence. If students are unable to report the absence by computer, they may reach the Office of Advocacy and Success. Students with excessive absences who need academic or medical assistance can also contact the Office of Advocacy and Success.

Standard Academic Policies

For standard academic policy language and up-to-date student resources, see the University Policy and Student Support Syllabus Part 2. These four policies, however, are required:

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

All infractions of academic dishonesty by undergraduates must be reported to Undergraduate Studies for resolution through that office. In cases of plagiarism instructors may use the Plagiarism Resolution Form.

Additionally, for undergraduate classes:

Plagiarism, which includes the intentional or unintentional copying of language, structure, or ideas of another and attributing the work to one's own efforts. Graded works generated by artificial intelligence or ghostwritten (either paid or free) are expressly forbidden.

See the Undergraduate Academic Integrity Policy website for additional information and the current catalogue for the policy.

For graduate students, see the current Graduate School Handbook for all policies and procedures.

Accessibility

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and are encouraged to request accommodations through SAS (Student Accessibility Services) as soon as possible. To request accommodations through SAS, please see this link: (https://www.clemson.edu/academics/studentaccess/register.html). You can also reach out to SAS with questions by calling 864-656-6848, visiting SAS at the ASC Suite 239, or stopping by the office as a drop-in appointment.

The Clemson University Title IX Statement Regarding Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This Title IX policy is located on the Access and Equity website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Assistant Vice President of Equity Compliance. Her office is located at 223 Brackett Hall, 864-656-3181 and her email address is alesias@clemson.edu. Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

Clemson University aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientation, religions, socioeconomic levels, political perspectives, abilities, opinions, values and experiences.

Emergency Preparation

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety. All students and employees should be familiar with guidelines from Clemson University Public Safety.

Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

1. Familiarize yourself with all possible exits, safer locations, and other key information on the emergency evacuation maps in this building, and those that you visit regularly.
2. Make a plan for how you would Run, Hide, and Fight in case of an active threat in this building, and those that you visit regularly. For example:

a. Run – what are all the possible exits in this building, and the routes to them?
b. Hide – what are the potential hiding locations in this room and building that are out of sight of doors and windows, how do you lock the door(s), how would you barricade the door(s) and windows, where do you turn off the lights?
c. Fight – What tools are available in this room and building, should you have to fight?

3. Ensure you are signed up for emergency alerts. Alerts are only sent when there is a potential threat to safety, a major disruption to campus services, and once-monthly tests.
4. Download the Rave Guardian app to your phone. (https://www.clemson.edu/cusafety/cupd/rave-guardian/)
5. Learn what you can do to prepare yourself for the hazards that affect our locations. (http://www.clemson.edu/cusafety/EmergencyManagement/)