



School of Computer and Information Sciences

COURSE SYLLABUS

Course Information

MSAI631 - A01 Artificial Intelligence for Human-Computer Interaction

Summer 2024 First Bi-Term

Course Format: Online

CRN: 2024-SUMMER-1BT-MSAI-631-A01

Class Time and Location: Online

Instructor Information

Name: Alan L Dennis

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Office Location: Remote

Office Hours/Preferred Contact Times: By Appointment

UC Directory URL: <https://www.ucumberlands.edu/directory/dr-alan-l-dennis>

Course Description

This course examines the convergence of Artificial Intelligence (AI) and Human-Computer Interaction (HCI) and how they have revolutionized the ways we interact with machines and systems. The class emphasizes the symbiotic relationship between AI and HCI, equipping students with the knowledge and skills to design, develop, and optimize intelligent interactive systems.

Course Objectives

Upon completion of this course:

- Comprehend the foundational concepts of Artificial Intelligence (AI) and Human-Computer

Interaction (HCI) and recognize how their integration shapes modern interactive systems, user experiences, and digital interfaces.

- Apply user-centered design principles, usability heuristics, and accessibility guidelines to design and develop intuitive, user-friendly interfaces that cater to diverse user needs and preferences.
- Demonstrate proficiency in integrating machine learning techniques, such as pattern recognition, classification, and clustering, to create real-time interfaces that adapt to user interactions and preferences.
- Develop expertise in creating AI-powered natural language interfaces by exploring concepts in Natural Language Processing (NLP), enabling the design of conversational agents, chatbots, and voice-driven applications.
- Identify potential ethical challenges related to AI-powered interfaces, including bias, privacy, transparency, and accountability, and propose strategies to address these concerns while designing HCI solutions.
- Gain practical experience in designing, prototyping, and evaluating AI-driven interactive systems through hands-on projects, applying usability testing and iterative design to refine and optimize the user experience.

Learner Outcomes

- Analyze AI, HCI, and how they interact
- Analyze the importance of HCI Multimodal Interfaces
- Evaluate user-centric design principles
- Create and discuss usability heuristics
- Evaluate the importance of accessibility guidelines, including legal and ethical implications
- Analyze the ways to evaluate the extent of user-friendliness of an application

- Analyze the approaches to using AI techniques to improve user experience
- Create a recommendation system using AI and HCI concepts
- Apply NLP concepts such as tokenization in an NLP-based chatbot
- Evaluate Prompt engineering (hard prompts) and discuss alternative approaches
- Create an intelligent chatbot by integrating a traditional chatbot with an AI-as-a-Service offering (such as Azure Cognitive Services)

Course Website

Access to the course website is required via the iLearn portal on the University of the Cumberlands website: <http://www.ucumberlands.edu/ilearn/> or <https://ucumberlands.blackboard.com/>

Required Books and Resources



Title: Human-Centered AI

ISBN: 9780192845290

Authors: Ben Shneiderman

Publisher: Oxford University Press

Publication Date: 2022-01-01

Title: <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed>

To access your course materials, simply click on the Course Materials link located in the left menu of your course in iLearn.

Requirements and Policies

Academic Dishonesty Policy

As a Christian liberal arts university committed to the pursuit of truth and understanding, any act of academic dishonesty is especially distressing and cannot be tolerated. In general, academic dishonesty involves the abuse and misuse of information or people to gain an undeserved academic advantage or evaluation.

The common forms of academic dishonesty include:

1. cheating – using deception in the taking of tests or the preparation of written work, using unauthorized materials, copying another person's work with or without consent, or assisting another in such activities;
2. lying – falsifying, fabricating, or forging information in either written or spoken presentations;
3. plagiarism – using the published writings, data, interpretations, or ideas of another without proper documentation.
4. multiple submissions - submitting the same academic written or oral work for which credit was previously received, without the approval of the instructor.

Episodes of academic dishonesty are reported as appropriate to the Vice President for Academic Affairs. The potential penalty for academic dishonesty includes 1) a failing grade on a particular assignment, 2) a failing grade for the entire course, 3) suspension or expulsion, or (4) revocation of a degree.

Attendance Policy

Course enrollment and participation will be monitored and verified for all students during the first two weeks of classes. Lack of participation during this time may jeopardize enrollment status. Each student is expected to meet course expectations by completing the coursework required each week. Active participation and staying abreast of the material is essential to success. Program specific attendance policies may still apply.

Participation Policy

- Students are expected to actively participate in an intelligent discussion of assigned topics in all areas, such as Discussion Board Activities, Synchronous Sessions, Forums, Shared Papers, etc.
- Point adjustments will be taken for non-participation.

Course Evaluations

The course evaluation will be open during the last two weeks of the term. To access the evaluation (during that time), visit <https://uofcumberlands.campuslabs.com/eval-home/> and log-in using your UC credentials. A reminder email notification will be sent when the evaluation is available.

We value your feedback. Every evaluation is confidential and anonymous. The anonymous results of the course evaluations are not available for faculty to see until after final grades are submitted. Your thoughtful responses guide future improvements for the course and programs.

Disability Accommodations

University of the Cumberland accepts students with certified disabilities and provides reasonable accommodations for their certified needs in the classroom, in housing, in food service or in other areas. For accommodations to be awarded, a student must submit a completed Accommodations Application form and provide documentation of the disability to the Disability Services Coordinator (Shirley Stephens, Gatliff Administration Building, Room 114, accommodations@ucumberlands.edu). When all paperwork is on file, a meeting between the student and the Coordinator will be arranged to discuss possible accommodations before accommodations are formally approved. Students must then meet with the Coordinator at the beginning of each semester before any academic accommodations can be certified for that term. Certifications for other accommodations are normally reviewed annually.

Academic Appeal

Both undergraduate and graduate students have the right to challenge a grade. Before filing a formal appeal, the student must discuss the grade with the course instructor and department chair. If discussions with the course instructor and department chair do not lead to a satisfactory conclusion, students may file a formal written appeal with the Vice President for Academic Affairs, who will forward the appeal to the chair of the Academic Appeals Committee.

This formal written appeal to challenge a grade must be filed four weeks after the last day of class for the semester in which the course being appealed occurred. The Academic Appeals Committee then reviews the student's written appeal and gathers information from the instructor and any other relevant parties. The Committee will deliver its recommendation on the complaint to the Vice President for Academic Affairs. After reviewing this recommendation and concurring or amending it, the Vice President for Academic Affairs will inform the student and instructor of the disposition of the complaint no later than the last day of classes of the term in which the complaint was filed.

Records of all actions regarding academic grade appeals, including their final disposition, are maintained by the Vice President for Academic Affairs and the Academic Appeals Committee.

Student Responsibilities

Students should:

- Use University of the Cumberlands email system for all academic, administrative, and co-curricular communication between faculty, staff and peers.
- Check for email and class announcements using iLearn (primary) and University of the Cumberlands webmail (secondary) daily.
- Demonstrate Cumberlands Character in and outside the classroom per the University Mission & Vision
- Ensure you have consistent required technology for the course
- Participate in courses regularly to:
 - Find announcements and updates
 - Complete assignments on time. Keep in mind that all deadlines use Eastern Standard Time (EST).
 - Engage in discussion
 - Connect with fellow students and faculty
- Present written work in an academic and professional manner.
- Take examinations on the designated dates and times. Students should make arrangements with faculty before the designated date for any needed accommodations.
- Contact faculty or student success coordinator with questions or concerns.

Course Policies

1. The only authorized electronic means of academic, administrative, and co-curricular communication between the University of the Cumberlands and its students is through the UCumberlands email system (i.e., Webmail). Each student is responsible for monitoring his/her University email account frequently. This is the primary email account used to correspond with you directly by the University; imperative program information is sent to this email account specifically from campus and the program office.
2. Students should check for e-mail and class announcements using iLearn (primary) and University of the Cumberlands webmail (secondary).
3. Students are expected to find out class assignments for missed classes and make up missed work.

4. Students are expected to determine if any changes have been made to the class or assignment schedule.
5. Written work must be presented in a professional manner.
6. Work that is not submitted in a professional manner will not be evaluated and will be returned as unacceptable.
7. There is a craft to writing. Spelling, grammar, punctuation, and diction (word usage) are all tools of that craft. Writing at the collegiate level will show careful attention to these elements of craft.
8. Work that does not exhibit care with regard to these elements will be considered as inadequate for college writing and graded accordingly.
9. Students are expected to take the examinations on the designated dates. If you are unable to take the exam on the scheduled date and know in advance, you are to make arrangements with your professor before the designated date. If you miss the exam, you must have a legitimate reason as determined by your professor.

Recognizing that a large part of professional life is meeting deadlines, it is necessary to develop time management and organizational skills. Failure to meet the course deadlines may result in penalties. Keep in mind that all deadlines are set using Eastern Standard Time (EST). **Late assignments will NOT be accepted.**

Course Activities and Experiences

Students are expected to:

- Review any assigned reading material and prepare responses to homework assigned.
- Actively participate in activities, assignments, and discussions.
- Evaluate and react to each other's work in a supportive, constructive manner.
- Complete specific assignments and exams when specified and in a professional manner.
- Utilize learned technologies for class assignments.

Connect content knowledge from core courses to practical training placement and activities.

Links to Support

UC Academic Catalog: <https://www.ucumberlands.edu/academics/academic-catalog>

UC Student Handbook: <https://www.ucumberlands.edu/student-handbook>

Academic Resources & Writing Center: www.ucumberlands.edu/learningcommons

Library: <http://www.ucumberlands.edu/library/>

Bookstore: <https://cumber.bncollege.com/shop/cumberlands/home>

About University of the Cumberlands: <https://www.ucumberlands.edu/about/presidents-welcome>

Instructions for Accessing, Downloading, and Activating Office 365 Pro Plus (free for UC Students): <https://helpdesk.ucumberlands.edu/support/solutions/articles/7000045435>

Student Course Concern Early Detection Form

Students can use the Early Detection form to share concerns about their courses with program administration and Academic Affairs. Concerns will be reviewed, and your name will not be shared with the professor unless you grant permission first. The form is not a course evaluation but a place to communicate concerns related to delayed grading beyond 7 days of the assignment's due date, faculty not responding to emails (no response in over 36 hours), or folders or content unavailable.

If you are uncomfortable completing the form, please contact your student success coordinator or academicaaffairs@ucumberlands.edu.

Use this [Early Detection Form](#) to submit your concerns.

Course Evaluation

A student will be evaluated/weighted on the following basis:

1. Exams - Each exam will consist of multiple-choice, multiple answers, matching, and True/False questions. Exam items are derived primarily from lectures and readings. Exams will be available through iLearn and completed independently.
2. Homework Assignments, Discussion, & Quizzes – Assignments, Discussion, & Quizzes will be given throughout the term. Each quiz will consist of multiple-choice/answer, short answer questions, matching, and True/False questions — quiz items derived primarily from lectures and readings. Quizzes will be available through iLearn and completed independently. Assignments and Discussions will come from the course lectures, materials, and required reading assignments.
3. Practical Connection Assignment – Written Assignment where students will reflect on course concepts and their practical connection to a working environment.
4. Group Project - Students will be randomly grouped in iLearn. Each group will submit their research project as a group.

Category Category (i.e. discussions, exams, etc.)	Qty.	Points Each	Total
Discussion	2	10	20
Project Report	6	40	240
Exercise	7	30	210
Report	2	40	80
Group Project – Project proposal	1	80	80
Group Project – Presentation	1	80	80
Group Project – Results Report	1	80	80
Total Points			1000

Grading Scale

Graded work will receive a numeric score reflecting the quality of performance as given above in evaluation methods. The overall course grade will be determined according to the following scale:

- A= 900 – 1000 (90% - 100%)
- B= 800 – 899 (80% - 89%)
- C = 700 – 799 (70% - 79%)
- F ≤ 699 (Below 69%)

Course Schedule

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Dates	Topics/Readings	Assignments and (Point Values)
Week 1	Chapters 1 and 10 Journal Articles	Introductions Discussion (10) GitHub Repo Exercise (30) Document Development Environment Setup Exercise (30)
Week 2	Chapters 2 and 3 Journal Articles	AI and HCI Interactions and Synergies Exercise (30) Design Thinking in HCI/AI Exercise (30)
Week 3	Chapters 8 and 9 Journal Articles	Prototype Simple Traditional Chatbot Project (40) Integrate Traditional Chatbot with AI Service Project (40)
Week 4	Journal Articles	Design a Conversational Agent Exercise (30) User-Centric Design Principles in Project (40) Group Project Proposal (80 Points)
Week 5	Chapters 5 and 6 Journal Articles	Evaluating User-Friendliness of an Application Project (40) Chatbots compared to Virtual Assistants Report (40) Practical Connection Assignment (50 Points)
Week 6	Chapter 4 Journal Articles	Recommendations System using AI/HCI Project (40) Identifying Ethical Challenges During AI/HCI Design Exerc
Week 7	Chapter 7 Journal Articles	Adaptive UI using AI/HCI Project (40) Accessibility Guidelines Exercise (30) Group Project Design Documentation (80 Points) Group Project Source Code in GitHub (80 Points)
Week 8	Journal Articles	Bias in AI/HCI Interfaces Report (40) Group Project Presentation (80 Points) Group Project Results (80 Points) Reflections Discussion (10)

Note that week is a short week.

Syllabus Disclaimer

This syllabus contains important information critical to your success in this course. It includes guidelines for this course and the instructor's current expectations about content, schedule, and requirements necessary for each student to achieve the best educational results. While you must review and become familiar with the contents of this syllabus, the instructor reserves the right to make adjustments or change in the syllabus from time to time. Any changes to the syllabus will be discussed with the students.