

CS 500 – Current Topics in Computing Education Research

Location: 1304 Siebel Center, Time: Tuesday, Thursday 9:30-10:45 am

Instructors: Prof. Geoffrey L. Herman, glherman@illinois.edu, 3213 Siebel Center

Prof. Mariana Silva, mfsilva@illinois.edu, 2213 Siebel Center

Nico Ritschel, ritschel@illinois.edu

Office Hours: by appointment

Readings: Available in PrairieLearn

Course Overview: In this project-based learning course, students will work in teams to develop HTML elements that can be used by an instructor to develop a suite of new question generators for the PrairieLearn platform (e.g., freehand sketch grading tool, randomizable circuit generator). To complete these projects, students will learn about principles for the design of effective online assessments and learning activities. They will also learn about user-centered design techniques and apply principles from software engineering and human-computer interactions. Students will conduct a user-experience study and potentially incorporate their tool into an actual course or publish about their tool in relevant education conferences.

Prerequisite Knowledge: Evidence of reasonable proficiency in Python and HTML or we might ask you to do a brief diagnostic interview.

Helpful but not required: basic knowledge of Bootstrap CSS; some knowledge of JavaScript and some of its major libraries (jQuery, d3)

Learning Objectives: By the end of this course, students will be able to

- 1) Articulate the benefits of assessment-driven instruction
- 2) Describe the benefits of randomization and computer-based testing
- 3) Develop an HTML element that enables randomizable, assessment-driven instruction
- 4) Conduct user-experience studies to understand a user's needs, project specifications, and whether an attempted implementation meets those needs and specifications
- 5) Conduct code reviews and provide actionable, constructive feedback on code written by other students

Course philosophy and Grading Policy

Research routinely shows that we learn best when we are guided by our intrinsic motivations to learn, or curiosity, rather than by extrinsic motivations such as grades and requirements. We believe that as graduate students, you are mature, adult learners. We want you to develop the habits of being reflective and discerning for yourself whether you have mastered the knowledge and skills you are seeking to master. Further, it is our belief that the goal of graduate studies is for each of you to become independent thinkers and thought leaders capable of guiding your own learning and the learning of others. For these reasons, we believe that it is essential to give you some control of the grading and feedback process. You will be responsible for determining your grade in the course based on the course expectations. We will reserve the right as instructors to adjust your grades based on our dialogues with you.

Expectations

If you meet the following expectations, you should award yourself a B. If in addition to meeting the expectations and you have excelled at contributing to class discussions, writing assignments, thoughtfully revising written assignment, or have achieved some other major personal learning milestones, you should award yourself an A.

1. Attend class regularly (e.g., not missing more than a week's worth of classes)
2. Meet due dates and expectations for all assignments
3. Actively participate in all in-class exercises and activities
4. Give thoughtful peer feedback and work faithfully with your group on your team projects
5. Make thoughtful and substantive revisions on assignments as needed/requested
6. Minimize typos and grammatical mistakes in writing
7. Attend feedback meetings with instructor
8. Meet personal learning goals

Turning assignments in and late policy

Assignments will be assigned and turned in via PrairieLearn/GitHub

Assignments must be submitted by posted deadlines. Assignments which are submitted late will either not be useful (e.g., reading reactions are only valuable in helping shape the in-class discussion) or will receive less time for constructive feedback. If you are planning to travel, notify the instructor immediately to make arrangements to complete assignments on time.

Assignment Synopses

1. Personal learning goals statement and reflection

All of us will have different motivations for learning the content of this course. During the first week of class, you will write a personal learning goals statement.

The purpose of this assignment is for you to reflect on why you are taking the course, what you hope to achieve, and how this course will fit into your broader missions and dreams. We want you to reflect on why you signed up for this course and how you think this course will help you achieve those goals. This assignment will help us determine the topics that we explore in greater depth and will shape our course discussions.

2. IRB training

You will be conducting interviews with faculty and using information from those interviews to guide your design of an HTML element. You may also engage with students to see how they interact with your HTML element. We want to ensure that you have training and preparation for ethically handling this type of data. By the end of the first week, we ask that you complete IRB training. cititraining.org

3. Reading and reading reactions

For each set of readings, you will post a brief response (< 200 words) to the readings, such as an interesting quote or idea that grabbed your imagination, a point on which you disagreed with the author(s), or a musing you had based on the readings. You will also need to post at least one question that you would like to discuss further in class. These reactions are due at least 24 hours before the following class meeting.

4. Class participation

We will have in-class discussions about readings and feedback sessions with the instructors. You are expected to actively participate in these.

5. Getting started with PrairieLearn development

In Week 1, you will set up a local development environment for PrairieLearn. By the end of Week 2, you will demonstrate the ability to modify question, assessments, and HTML elements in PrairieLearn.

6. Midterm Project

During Weeks 3-6, you will work in a team to create a Truth Table HTML element. You will provide peer feedback on the implementations of other teams and conduct a user-experience study with Professor Herman.

7. Final Project

Starting in Week 7, you will select an HTML element to implement. You will conduct user interviews to develop a specification for the element, implement the element, provide peer feedback on the HTML elements of other teams, conduct some user-experience studies, and present your HTML element to the class.

Rough outline of course activities

Week of	Topics/Activities
8/26	Overview of PrairieLearn, GitHub, Docker, Mustache Readings on the role of assessment in learning Modify an existing PrairieLearn element
9/2	How to conduct a code review Code reviews on PrairieLearn element modifications More readings on the role of assessment in learning
9/9	How to conduct a user-experience study Begin development of Truth Table HTML element
9/16	More on how to conduct a user-experience study Finish first-draft of Truth Table HTML element
9/23	Conduct user-experience study and revise HTML element
9/30	Peer code reviews Final project identification
10/7	Students begin final project
11/4	Initial draft of projects due Preliminary user-experience study Peer reviews
12/2	Code revisions due Final user-experience study due
12/9	Final presentations

Statement of Academic Integrity

The Code of Policies and Regulations Applying to All Students will be applied in all instances of academic misconduct committed by students. This policy will apply to all assignments, papers, and materials distributed or used in this course. You can review this policy at the following web site:

http://admin.illinois.edu/policy/code/article1_part4_1-401.html, Article 1, Part 4 – Academic Integrity and Procedure.

Accommodations

Our hope is that every student can succeed and thrive in the course. We will gladly support any accommodations we can in accordance with campus policy. We understand that grad school and life in general can become super stressful for every student (We're no exception!). We're aware that it can be embarrassing or difficult at times to request needed accommodations. Please know that we want to help and that we sincerely invite you to request any support you need, even if you do not yet have a DRES accommodation letter. The best accommodations are ones that we know about in a timely manner. Our experience is that delayed requests only create more stress and anxiety for you. To best help you, we have a policy that you must request accommodations for non-extenuating circumstances before or within 48 hours of the due date of an assignment. Our intention behind this policy is to encourage you to come talk to us early and often. We want you to succeed and thrive!

Mental Health

We are concerned about advancing the mental health and well-being of our students. Diminished mental health, including significant stress, mood changes, excessive worry, substance/alcohol abuse, or problems with eating and/or sleeping can interfere with optimal academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings at no additional cost. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do – for yourself and for those who care about you. Also, let's lookout for each other and help others get the help that they need!

Counseling Center: 217-333-3704, 610 East John Street Champaign, IL 61820

McKinley Health Center:217-333-2700, 1109 South Lincoln Avenue, Urbana, Illinois 61801

Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at <https://odos.illinois.edu/community-of-care/resources/students/religious-observances/> to request appropriate accommodations. This should be done in the first two weeks of classes.

Statement on Racism and Inclusion

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) <https://bart.illinois.edu/>. Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.