

University of Illinois Urbana-Champaign
Department of Industrial and Enterprise Systems Engineering

SE 598 – Research Methods in HFE

Instructor: Professor C. Cao

Meeting Time: Wednesdays 13h00 – 15h50

Classroom: 206 Transportation Building

Course site: <https://canvas.illinois.edu/courses/56236>

Office Hour: Wednesdays 4-5pm, in-person or zoom

Office: 111 Transportation Building

Zoom: <https://illinois.zoom.us/my/caocaroline?pwd=RlI0SjZxczZlQU9lTzRFUUR5WVk2dz09>

Email: cca01@illinois.edu

Course Prerequisite: Graduate standing.

Course Description:

Human factors engineers must make many choices when confronted with a research problem. This holds for problems presented in applied settings as well as theory-generated problems. We will examine some of these problems and discuss the costs and benefits of the various methods available to human factors engineers in solving these problems. The three main objectives of this course are as follows:

- ❖ Understanding methodological problems in research involving human participants
- ❖ Learn and apply common HF research methods (i.e., design and conduct controlled and field experiments, collect and analyse data), and interpret the results
- ❖ Writing a manuscript in the APA or IEEE format for submission to a journal or a scientific conference, and delivering oral presentations

Required text: N/A

Grade Distribution

Half of your grade will be based on participation in class discussions, presentations, attendance at research seminars and technical conferences, as appropriate. The other half of your grade will be based on deliverables of a research project. All research project deliverables must be submitted to receive the project mark. Any missing deliverable will render the project incomplete and thus 0/50.

Weekly assignments & oral reports	50%
Research project (manuscript, abstract, poster, presentation)	50%

Grading Policy:

90-100%	A
80-89%	B
70-79%	C
50-69%	D
<50%	F

Policy for late submissions:

Assignments are expected by the specified deadlines. Late assignments will be returned without review (similar to funding agency practice). Students are responsible for all assigned materials. Exceptions (medical, bereavement, or religious reasons) should be documented.

Academic integrity:

All assignments will be checked for plagiarism using Turnitin. An assignment receiving a similarity result of 20% or higher on Turnitin (not counting list of references) will automatically result in a failing grade for the course, and the student will be cited for violation of academic integrity. Please refresh your memory of the UIUC Academic Integrity Policy: <https://studentcode.illinois.edu/article1/part4/1-401/>, especially Article 1, Part 4: Academic Integrity.

Accommodations for individuals with disabilities

Please contact Disability Resources and Educational Services (DRES) within the first 2 weeks of the semester (go to 1207 S. Oak St., Champaign, or call 333-4603, or e-mail disability@illinois.edu). For more information, visit the <http://www.disability.illinois.edu/>

Additional university resources

- Library Savvy Researcher workshops and guides
 - <https://calendars.illinois.edu/list/4068>
 - https://guides.library.illinois.edu/sb.php?subject_id=70338
- Graduate College Grant Writing Workshops and Resources
 - <https://grad.illinois.edu/fellowship/external-workshops>
 - <https://grad.illinois.edu/fellowship/external-resources>
- Writer's Workshop
 - Undergrad Library
 - 217-333-8796
 - <https://writersworkshop.illinois.edu>
 - Offers consultations, workshops, resources, etc. Explore their website!
- <http://www.cws.illinois.edu/workshop>
- <https://www.disability.illinois.edu/strategies>
- <http://www.counselingcenter.illinois.edu/self-help-brochures/>

Counseling services:

Kenneth L. Nafziger, PhD
Embedded Counselor in Engineering, Licensed Psychologist
210-A5 Engineering Hall

Counseling Center
206 Student Services Building
7:50 a.m.-5:00 p.m., Monday through Friday
Phone: 217-333-3704

McKinley Mental Health
313 McKinley Health Center
8:00 a.m.-5:00 p.m., Monday through Friday
Phone: 333-2705

McKinley Health Education offers individual consultations for students interested in learning relaxation and other stress/time management skills, call 333-2714.

General Emergency Response Recommendations

A university-wide Emergency Dean is always available to provide personal assistance in times of

emergency (e.g., serious illness, hospitalization, accident, death or other major crisis). Emergency Dean Service: 217-333-0050.

Emergency response recommendations can be found at the following website:

<http://police.illinois.edu/emergency-preparedness/>. Review this website and the campus building floor plans website within the first week of class: <http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/>. View the campus safety video and join Illini Alerts.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.

Sexual Misconduct Policy and Reporting

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 and Disability Office. In turn, an individual with the Title IX and Disability 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: <https://wecare.illinois.edu/resources/students/#confidential>. Other information about resources and reporting is available here: wecare.illinois.edu.

Statement on Diversity 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. All students should be treated with respect, so that they can live and learn without marginalization and racism being instigated by other members of our community. Both overt racism and micro-aggressions threaten inclusivity and hence, have no place at the University of Illinois.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows all students equitable opportunities and respect. All of us are expected to help establish and maintain an environment where you and your peers can contribute with fear of 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.

College statement about COVID-19

University policy requires all students to protect the health and safety of community members by wearing masks and maintaining social distance when appropriate and stay away from class when ill.

Statement regarding copyright

Material associated to this course has been developed solely for the students enrolled in this course. Use

of this material by anyone not associated with this course violates Copyright, and the person or persons may be subjected to the Ethics Code of Conduct from the University of Illinois Urbana-Champaign.

Communication

All communication in this course will be through the course website on Canvas, including announcements and assignments. Please check the site regularly.

Tentative Class Schedule (subject to change):

Week	Date	Topic	Project Deliverables and other assignments
1	22/01/2025	Introduction to course content; Scientific research; research involving human subjects; ethical conduct of research; needs- vs hypothesis-driven research; research methods	a) pre-course questionnaire b) CITI Training (5pts) c) librarian appointment (5pts)
2	29/01/2025	Lecture: Literature review (Online lecture)	Conduct literature review. Generate research questions with or without application, conduct a preliminary lit review, propose research objectives (5pts)
3	05/02/2025	Student in-class presentation: Research motivation, questions, objectives, plan for research	Review classmate’s lit review. Conduct task analysis and generate hypotheses/needs (5pts)
4	12/02/2025	Lecture: Qualitative studies: Questionnaire design and analysis; standardized tools (UX, SA, NASA TLX, etc.)	Design a questionnaire and pilot test (10pts)
5	19/02/2025	Student in-class presentation:	Collect data using questionnaire. Analyse and interpret. Generate hypotheses
6	26/02/2025	Lecture: Quantitative studies: Psychometrics ; psychophysics ; signal detection theory; Fitts’ Law ; etc. Experimental design and analysis	
7	05/03/2025	Student in-class presentation:	Design experiments, IRB protocol for experiment (10pts)
8	12/03/2025	Lecture: Data collection; Analysis and interpretation of results	
9	19/03/2025	Spring Break	Pilot results presentation (10pts)
10	26/03/2025	Student in-class presentation:	Short and long conference abstract (10pts)
11	02/04/2025	HFES Healthcare Symposium (online lecture)	
12	09/04/2025	Lecture:	

		Technical writing, research results reporting	
13	16/04/2025	Student in-class presentation:	1-page summary of 2 talks and/or posters at Empathy Workshop April 10 (10pts)
14	23/04/2025	Lecture: Grant proposals and peer review	Conference paper/white paper/grant proposal (10pts)
15	30/04/2025	Student in-class presentation: Poster session (conference-style)	1-page summary of 2 talks and/or posters at IMMERSE Symposium April 29-30 (10pts); ePoster (10pts)
16	07/05/2025	Student in-class presentation: Oral presentations (in the style of conference presentation or thesis defence)	Presentation slides (10pts) Presentation (20pts)

All assignments and deliverable are due one day before class the next week, at 5pm. There is no final exam for this course.