

EER 601: Foundations of Engineering Education Research

Course Syllabus – Fall Semester 2023

Course instructor Professor Cindy Finelli (she/her/hers), cfinelli@umich.edu, 4413 EECS Building.

Reaching the instructor The best way to reach me is by email. You can expect to receive an email response within a few hours during my regular work times (Monday through Friday, 8:30 am – 4:30 pm). Response time will be delayed outside of these hours.

Inclusive teaching statement I am firmly committed to supporting UM’s policy of equal opportunity for all persons. It is my intention that students from all backgrounds and perspectives will be well served by this course and that the diversity that students bring to this course will be viewed as an asset. I welcome all individuals, regardless of race, color, national origin, age, background, ethnicity, gender, gender identity, gender expression, sexual orientation, national origin, religious affiliation, socioeconomic background, marital status, family education level, ability, height, weight, and veteran status, as well as individuals with other visible and nonvisible differences.



Everyone is expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the course.

Please contact me with any problems, concerns, or suggestions.

Preferred name and personal pronouns I will gladly use your preferred name and personal pronouns. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

Class meetings Monday / Wednesday, 10:30–11:50 am, Room 1008 EECS. This is an in-person course.

Course web site The course Canvas site will contain the following items, among others: announcements, access to class discussions, assignment links, and required and supplementary reading material. Sign in with your UM ID and Kerberos password and select the EER 601 tab.

Required textbook There is no required textbook for this course.

Catalog description *Foundations of Engineering Education Research* (3 credits)
Introduction to the field of engineering education research (EER); the conduct of educational research and its application to engineering education; current literature in EER; the use of theoretical and conceptual frameworks to guide EER; and professional development opportunities in EER.

Course goals EER 601 will provide you with an overview of EER. Specific course goals are to:

1. Expose you to a wide range of research topics and methods in EER
2. Introduce the EER taxonomy as a framework for approaching the field
3. Engage you in thinking critically about, reflecting on, and discussing current EER literature
4. Introduce you to EER faculty at UM and beyond, to pioneers in the EER field, and to other researchers

Course objectives

Upon completion of this course, you should be able to:

- Define EER and describe the field
- Use the EER taxonomy to categorize different topics in the field
- Read, reflect on, and evaluate current EER literature
- Engage in discussions related to current EER literature in a graduate setting
- Prepare and lead a class discussion about an assigned EER-related topic
- Describe the research foci and career trajectories of both EER faculty at UM and other guests
- Reflect on and write about how EER relates to your personal research interests and your future career trajectory

Office hours

Office hours for this course will be by appointment. Please email me to arrange a convenient meeting time.

Course format

This course will be taught in an in-person only format. You'll be expected to complete some coursework before each class session, and we will meet twice each week.

To accommodate occasional, unavoidable absences, all lectures will be video recorded, and the recordings will be posted on Canvas. *Thus, as part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact me during the first week of class to discuss alternative arrangements.*

Note: Successful completion of this course is probably going to require considerable time and reading, something like 15-20 hours of work each week outside of class. The first three weeks will involve more reading than the remainder of the course.

A note on reading

(Adapted from
N. Pitterson, 2018)

Reading in this class is probably unlike the reading you've done for other engineering courses; we'll be reading work from a range of disciplines that have very different traditions for building and sharing knowledge.

So what should you look for? How do you approach articles that rely heavily on theory and/or use human-subject research to provide evidence? Be prepared to spend time reading and re-reading; most of the articles in this class are not a "quick skim." Throughout the semester, we'll spend a good bit of time learning to "unpack" the readings, but here are a few tips to get you started:

- Start by skimming the entire article to review the headings, tables and figures, and any bold text. This approach can help you get the "big picture" and provide some orientation.
- As you read, try to identify the context in which the author is situated, the thesis or central argument, and the supporting evidence
- Consider reading with a pencil or annotation software to make notes, write comments (including reverse outlining), and enter into a dialogue with the text, rather than simply using a highlighter.

The readings form the central basis for our discussion, so in class, you should be drawing on them heavily.

Tentative course schedule

The tentative class schedule is shown in the table below.

Unit 1 – Introduction to EER			
Week	Date	Class #	Topic
1	08/28/23	1	Overview of EER
1	08/30/23	2	Development of the field
2	09/04/23	~~~~~	NO CLASS – LABOR DAY ~~~~~
2	09/06/23	3	Getting started in EER
3	09/11/23	~~~~~	NO CLASS – SEFI ~~~~~
3	09/13/23	4	Methods in EER
4	09/18/23	5	Mixed methods research
4	09/20/23	6*	Literature reviews – Jamie Niehof
5	09/25/23	7	Global perspectives on EER
Unit 2 – EER at University of Michigan			
Week	Date	Class #	Topic
5	09/27/23	8	Student resistance to active learning – Cindy Finelli
6	10/02/23	9*	Gender and student teams – Robin Fowler
6	10/04/23	10*	Student mental health – Karin Jensen
7	10/09/23	11*	Engineering ethics instruction – Aaron Johnson
7	10/11/23	12*	K12 data literacy – Mark Guzdial
8	10/16/23	~~~~~	NO CLASS – FALL BREAK ~~~~~
8	10/18/23	13	Creativity – Shanna Daly
9	10/23/23	14	Mentoring – Joi Mondisa
9	10/25/23	15*	Black men in engineering – James Holly, Jr.
10	10/30/23	16	Engineering career paths – Lisa Lattuca
Unit 3 – Topics in EER			
Week	Date	Class #	Topic
10	11/01/23	17	TBD
11	11/06/23	18	TBD
11	11/08/23	19	TBD
12	11/13/23	20	TBD
12	11/15/23	21	TBD
13	11/20/23	22	TBD
13	11/22/23	~~~~~	NO CLASS – THANKSGIVING BREAK ~~~~~
14	11/27/23	23	TBD
14	11/29/23	24	TBD
15	12/04/23	25	TBD
15	12/06/23	26	Final projects

**We will have visitors on these days*

Grading

Overall course grades will be based on the total number of points earned on all assignments, as listed in the table below. Final letter grades will be assigned at the end of the course.

Assignment	Due date	Points
Class participation	Each class session	10
Reflection posts	Each class day, 8:00 am	20
Personal interest statement	Wednesday September 13, 8:00 am	10
Representing an article	Wednesday, November 1, 8:00 am	10
In-class presentation	TBD	20
Final reflection project	Wednesday, December 6, 8:00 am	30
Total points		100

Submitting assignments

All class assignments will be posted on Canvas and should be submitted electronically through Canvas before the posted deadline. Students who are unable to meet the deadline should speak with Professor Finelli in advance.

Class participation
(10 points)

This is an in-person class, and your attendance and participation are important. Much of the course will involve in-class activities and discussions based on pre-class reading assignments. You are expected to come to class prepared for the discussion so that others may benefit from your perspective. Please respect others' opinions, listen carefully when others are speaking, and provide rationale for your own statements.

Starting with the second class session on August 30, you may earn ½ point for each of the subsequent sessions in which you actively participate, up to a maximum of 10 points. Thus, you may miss up to five class sessions with no direct penalty to your participation grade, and you will lose ½ point for each additional session you miss. Note, if you will be absent for conference travel or other unavoidable reasons, please inform Professor Finelli in advance.

Reflection posts
(20 points)

Due date: Each class day, 8:00 am

Twice weekly class readings and discussions will form the core of this course. Prior to each class session, you will be responsible for posting a response to the online discussion prompts for the assigned readings. The purpose of these posts is to allow you to reflect on the articles, summarize the readings in a concise manner, and shape some of the class discussions about the articles. You will earn 1 point for thoughtfully addressing each assigned post, up to a total of 20 points. There will be more than 20 reflection prompts, so it is possible to earn full credit without addressing every prompt.

**Pre-class reading assignments will be finalized no later than one week prior to class.*

Personal interest statement
(10 points)

Due date: Wednesday, September 13, 2023, 8:00 am

Specifications: double-spaced, 2 pages maximum

Everyone in this class brings diverse backgrounds, perspectives, and interests. Though some of you may already have a well-defined set of interests with respect to engineering education, many are excited to explore a wide range of new topics. The purpose of this assignment is for you to articulate and reflect on why you are enrolled in this course and what you expect to gain from it. In your two-page personal interest statement, please address the following:

- Why are you enrolled in this course (and in your graduate program)?
- What is your experience with respect to engineering education?
- What are five keywords that resonate with your research/career interests?
- What do you hope to get out of this course?

As for all assignments in this class, the document you submit should include your name, the date, and a title, and it should follow APA guidelines when applicable.

Representing an article
(10 points)

Due date: Wednesday, November 1, 2023, 8:00 am

Specifications: double-spaced, 2 pages maximum

Engineering education research articles are a key element of this course, and this assignment will require you to reflect more deeply on one specific article discussed during class, depicting it in both words and pictures.

- **Words:** Identify five keywords from the EER taxonomy that best describe your assigned article. Be sure to review the responses provided by your colleagues to the biweekly discussion posts, and use the guidelines provided with the taxonomy (i.e., select one or two keywords from each of three categories: context/ focus/ topic, purpose/ target/ motivation, research approach).

Pictures: Think creatively about how your assigned article (or some element of it) could be represented pictorially. Then, submit a photo that, to you, depicts the article. You may find the photo online or take one yourself. With the photo, provide a title and a one-paragraph description of how/why the photo represents article to you.

**The article you will represent will be finalized by 09/20/23.*

In-class presentation
(20 points)

Due date: One TBD class period between November 1 and 29, 2023

With a partner, you will be responsible for delivering an in-class presentation. You and a classmate will select a topic from a list of options and facilitate a class session that addresses an assigned pre-class reading and includes an in-class activity. You may supplement the pre-class reading with up to one additional resource and may use a range of instructional methods to enhance their peers' comprehension of the readings. You and your partner should create a lesson plan for the session (to be approved by Professor Finelli at least one week prior to the assigned class period), which could include providing additional resource for the session.

**Dates for the in-class presentations will be finalized by 10/11/23.*

Final class project
(30 points)

Due date: Wednesday, December 6, 8:00 am

Specifications: double-spaced, 5 pages maximum

Throughout this course, you will have read, reflected on, and discussed almost 40 engineering education research articles. Wow! This two-part assignment will require you to articulate the key takeaways by reflecting on what you learned in this course, how it applies in your life, and how it has affected you in a personal way.

The first part of the project includes a 5-page synthesis paper, and the second part is a creative expression of your paper (e.g., video, poster, art piece, etc.), to be shared in a public setting. We will discuss more about the final reflection project in class.

Student mental health and well-being

College can be a difficult time, and I am dedicated to supporting your mental health and well-being. College students sometimes experience stressors such as challenges related to academics, relationships, mental health, alcohol or other drugs, identities, finances, and more. These stressors can affect both students' academic experience and their personal well-being.

When you (or someone you know) is feeling overwhelmed, depressed, or in need of support, seeking help is a courageous thing to do for yourself and those who care about you. If the source of your stressors is academic, please contact me so that we can find solutions together. Please also consider using some of the many resources UM offers, as listed on the next page.

- **CAPS: Counseling and Psychological Services**, <https://caps.umich.edu/> 734-764-8312. CAPS is reachable during and after hours, on weekends and holidays, or through its counselors physically located on both North and Central Campus.
- **UHS: University Health Service**, 734-764-8320
 - **Mental Health Services**
<https://www.uhs.umich.edu/mentalhealthsvcs>
 - **Resources for Stress and Mental Health**
<https://uhs.umich.edu/stressresources>
 - **Resources for Student Well-being**
<https://wellbeing.studentlife.umich.edu/resources-list>
 - **Resources for Alcohol and Other Drugs**
<https://uhs.umich.edu/aodresources>
- **College of Engineering CARE Center**, <https://care.engin.umich.edu/>
- **Michigan Medicine Emergency Mental Health and Psychiatry**
<https://www.uofmhealth.org/conditions-treatments/emergency-mental-health-and-psychiatry>
Crisis phone service available 24 hours/day, 7 days/week, to people of all ages: 734-936-5900 or 734-996-4747
- **National Suicide Prevention Lifeline**: 1-800-273-TALK (8255).

Accommodations for students with disabilities

I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations should be made during the first three weeks of the semester, except for unusual circumstances, so I can make adequate arrangements. Please register with the Office of Students with Disabilities (<http://ssd.umich.edu/>), G-664 Haven Hall, 734-763-3000, to verify your eligibility for appropriate accommodations and to be issued a verified individual services accommodation (VISA) form.

If you need other accommodations for a disability, please let me know as soon as possible so we can discuss ways to support your success. Any information you provide is private and confidential and will be treated as such.

Instructor/student interactions

I am committed to creating a learning environment for my students that is free of prohibited conduct, including gender-based and sexual harassment, sexual violence, retaliation, and a hostile environment based on discrimination and intimidation. I acknowledge the power differentials between instructors and students, and the prohibition of covered relationships (sexual, romantic, or dating) between instructors and students. To accomplish this, I will:

- Conduct office hours with the door open unless the student requests a closed-door meeting
- Document pre-scheduled meetings with students via Google Calendar and/or university email so that this record can be reviewed
- Meet students individually only at university venues
- Conduct off-campus course meetings only at places where alcohol is not served
- Communicate electronically with students only on university platforms with the caveat that we may use non-university platforms set up by students (such as GroupMe) only if they include all students in the course.

**Academic integrity
and the honor code**

The College of Engineering is a community in which personal responsibility, honesty, fairness, respect, and mutual trust are maintained. You are expected to practice the highest possible standards of academic integrity – violations of these standards will not be accepted. The Honor Code is a statement of ethical standards by which the faculty and students of the College of Engineering conduct themselves. Both undergraduate and graduate students are bound by the provisions of the Honor Code; ignorance of it is no excuse to infringe upon it. You are expected to read and abide by the Honor Code (<https://ecas.engin.umich.edu/honor-council/honor-code/>).

All material you prepare for this course should be original. While it is expected that you will consult references in preparing material for the course, you may not submit material prepared by someone else or generated by AI (e.g., ChatGPT) as original material. Any evidence of this will be considered a possible Honor Code violation and reported to the Honor Council.