Foundations and the Field of Engineering Education Syllabus
ENGREDU 6100 Autumn 2024

Course Information

- **Course times :** Tuesdays 10:00 - 12:45 pm

- **Classroom:** Smith Lab 3058

- **Credit hours:** 3

- **Mode of delivery:** In Person

Instructor

- **Name:** Jialing Wu

- **Email:** wu.6489@buckeyemail.osu.edu

- **Office location:** By appointment

- **Office hours:** By appointment

Course Description

This course is open to all graduate students at the master's and doctoral levels and is designed to prepare them for future studies and careers in engineering education. Students will develop a foundational understanding of engineering education research (EER), including its history, key theories, and research methodologies. They will explore critical issues such as diversity, equity, inclusion, ethics, the role of engineers in society, and the global landscape of engineering education. Through readings, discussions, literature reviews, and presentations, students will examine how educational theories inform engineering teaching and learning, critically evaluate research, and connect findings to practice. By the end of the course, students will begin to identify and refine their individual research interests within the field. This course provides a foundational understanding of engineering education and equips students with the knowledge and skills to contribute meaningfully to the discipline.

Prerequisites: None.

Course Goals

- Identify key theories, research methods, and historical developments in engineering education.

- Explain critical issues such as diversity, equity, and ethics in engineering education.

- Apply educational theories to improve engineering teaching and learning.

- Analyze and evaluate engineering education research literature.

How This Course Works

Class consists of reading assignments, lectures, presentation, discussion and activities. Each class period, graduate students should be prepared to discuss the reading assignments.

Approximately:

　　o 1/3rd of the class will focus on instructor-led lectures and discussions on assigned readings, providing foundational knowledge on key topics in engineering education research. These sessions will help students engage with theoretical frameworks, research methodologies, and contemporary issues in the field.

　　o 1/3rd of the class will focus on student-led presentations, discussions, and activities based on the readings, allowing students to critically engage with the material, explore diverse perspectives, and apply concepts through interactive exercises. This component will foster active learning, peer collaboration, and deeper comprehension of engineering education literature.

　　o 1/3rd of the class will focus on workshops dedicated to literature reviews, where students will develop their ability to synthesize research, identify gaps in the literature, and refine their research interests. These sessions will provide guidance on structuring a literature review, evaluating sources, and integrating research findings effectively.

Credit hours and work expectations: This is a [3] credit-hour course. According to Ohio State bylaws on instruction (go.osu.edu/credithours), students should expect around [3] hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to [6] hours of homework (reading and assignment preparation, for example) to receive a grade of [C] average.

Weather or other short-term closing

Should in-person classes be canceled, we will meet virtually via CarmenZoom during our regularly scheduled time. Any updates will be shared via CarmenCanvas or email.

Required Course Materials

- Johri, A. (2023). *International Handbook of Engineering Education Research.* Taylor & Francis.

- Johri, A., & Olds, B. M. (Eds.). (2014). *Cambridge handbook of engineering education research.* Cambridge University Press.

- A book about literature review (TBD)

- All other seminar readings will be made available on CarmenCanvas. A bibliographic listing of assigned readings can be found at the end of the syllabus.

CarmenCanvas Access

Carmen is OSU's course management system. Carmen may be accessed at http://carmen.osu.edu. For troubleshooting, call 688-HELP or go to http://elearning.osu.edu/carmen-help/students/index.htm.

Grading

Assignment Category	Points
Class Participation & Preparation	**25 (In total)**
Class Participation (in conjunction with the Class Attendance policy)	*15%*
Each Week Questions for Reading on Discussion Board	*10%*
Leading Seminar Discussions	**30% (In total)**
Reading Connections & Leading Seminar Discussions 1	*15%*
Reading Connections & Leading Seminar Discussions 2	*15%*
Literature Review	**45% (In total)**
Literature Trace	*5%*
Literature Review - Draft	*10%*
Literature Review - Final Paper	*15%*
Literature Review - Final Presentation	*15%*

See Course Schedule at the end for due dates.

Grading Scale

93–100: A	90–92.9: A-	87–89.9: B+	83–86.9: B	80–82.9: B-	77–79.9: C+
73–76.9: C	70–72.9: C-	67–69.9: D+	60–66.9: D	Below 60: E	

Descriptions of Major Course Assignments

Class Attendance (in conjunction with the Class Participation/Preparedness grade):

In-person attendance during weekly seminar meetings is critical for success in the course. You are allowed ONE absence, which I will assume is for a good reason. Your final grade will be reduced as follows with more than 1 unexcused absence: 2 absences—reduced by 1 full letter grade; 3 absences—reduction of another full letter grade; etc. Absences are only excused with a doctor's note, for a religious observance, or something else indicating a bona fide reason for missing class. If unexpected or emergency circumstances prevent you from attending class, you are expected to contact me via email as early as possible and complete make-up assignments for the missed session.

Class Participation/Preparedness (15%)

Learning from peers is a key component of the graduate school experience. As your instructor, I will contextualize readings by placing them within the broader historical events and sociological debates that shaped them. Your role as students is to read the material carefully and come prepared with questions and comments for dialogue and debate. The issues we will explore in this seminar are often complex and highly charged, both academically and personally. Our task is to critically analyze and discuss our ideas, assumptions, and understandings of these texts, as well as the issues they seek to address, in a respectful and professional manner. You are expected to actively participate, be well-prepared for class, and arrive on time. I will take notes after each seminar meeting to track student participation and preparedness. Participation includes making productive contributions during discussions, such as sharing personal experiences, raising questions, and challenging ideas; providing relevant external resources, such as research articles or news reports; and maintaining an open mind to different perspectives to broaden intellectual engagement. Preparedness entails arriving on time, thoughtfully completing assigned readings, and bringing necessary materials for activities, such as questions for guest scholars or drafts for workshops.

Each Week Questions for Reading on Discussion Board (10%)

Each week, students are required to post at least one thoughtful question related to the assigned readings on the course discussion board. The question should demonstrate a critical engagement with the readings, such as identifying key concepts, raising points of confusion, connecting the readings to other topics discussed in class, or highlighting potential implications for engineering education research and practice. Students are also encouraged to respond to their peers' questions to foster collaborative discussion.

Reading Connections & Leading Seminar Discussions (15+15%)

In pairs or groups of three, you will co-lead two seminar discussions throughout the semester. Leading a discussion involves facilitating an engaging, 40-50 minute conversation on one assigned reading. You may choose one of the following approaches:

- Pose two discussion questions to guide small-group and full-class discussions about key ideas and arguments in the reading.

- Facilitate an interactive activity that creatively applies major ideas from the selected reading, followed by a whole-class debrief.

Examples of past activities include analyzing shared data, engaging with relevant audio or video content, and participating in a simulation or role-play exercise. Regardless of your chosen format, your discussion must address complementary and contrasting perspectives across the readings, highlight key implications for educational research and practice, and connect to questions on discussion board for that week. Discussion leaders must submit their plan or slides to me by Thursday 11:59 pm to receive feedback before class.

Literature Review (5+10+15+15%)
The literature review assignment is a multi-stage project designed to help students develop their understanding of a specific topic within engineering education research (EER) and strengthen their research synthesis and academic writing skills. This assignment is broken into four components:

- Literature Trace (5%)
  Students will submit an initial exploration of their selected research topic by identifying key themes, influential authors, and seminal works. This trace should outline the search process, including databases used, search terms, and a preliminary list of sources. It serves as a foundation for building a comprehensive literature review.

- Literature Review – Draft (10%)
  Students will submit a draft version of their literature review., focusing on developing at least two key sections of their final paper. These sections may include, but are not limited to, the introduction, theoretical framework, key themes and debates, or research gaps. Feedback will be provided to guide students in refining their final paper.

- Literature Review – Final Paper (15%)
  Building upon the draft and feedback received, students will submit a polished final version of their literature review. The paper should clearly synthesize existing research, identify gaps in the literature, and articulate how the topic contributes to the field of engineering education research.

- Literature Review – Final Presentation (15%)
  Students will deliver a presentation summarizing their literature review findings. The presentation should effectively communicate the key points from their paper, including major themes, research gaps, and implications for future research in engineering education. Students will also respond to questions and engage in a discussion with their peers.

All written submissions must adhere to standard formatting and style guidelines as outlined in the *American Psychological Association (APA) Formatting & Style Guide (7th edition)*. This includes double-spacing, a 12-point Times New Roman font, and 1-inch page margins. (For additional information, please visit: Purdue OWL APA Guide.)

Resubmit Assignment

I will administer and approve all course grades as outlined in the table above. Assignments that receive a grade lower than 90% of the total points may be revised and resubmitted. To revise an assignment, you must schedule an appointment with me to discuss the graded assignment and the necessary revisions to address feedback. Re-submitted assignments must clearly indicate revisions using tracked changes, such as an alternative font color for added content and strikethrough formatting for deleted content. All revised assignments must be submitted within one week after receiving the feedback and original grade.

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Late Assignment

If you need an extension on an assignment, please ask me with reasonable notice prior to the deadline. Extensions will be granted no later than 24 hours before the assignment deadline for legitimate reasons only. To be fair to other students, if an arrangement for an extension has not been made, your grade will be lowered by 10% each day that your assignment is late, including weekend days.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact the instructor for this course.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Instructor Feedback and Response Time

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **48 hours on days when class is in session at the university**.

- **Class announcements:** I will send all important class-wide messages through the email and Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.

- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.

- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **14 days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.]

Discussion and Communication Guidelines

- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.

- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

- **Backing up your work**: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Names and Pronouns:

If you would like to use a different name or pronouns than provided on Carmen, please let me know at any time prior to or during the semester. More information about name changes and pronoun designation for OSU class rosters can be found here.

Other Course Policies

Artificial Intelligence (AI):

University policy for AI can be found here. I will specify when and how you can use generative AI tools (e.g., ChatGPT), including guidance for attribution. Use of generative AI tools outside of these parameters is not allowed, and will be handled accordingly.

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

Online reporting form at equity.osu.edu,
Call 614-247-5838 or TTY 614-688-8605,
Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

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Diversity

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

https://odi.osu.edu/
https://odi.osu.edu/resources/student-resources
https://cbsc.osu.edu

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing.

If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th floor of the Younkin Success Center and 10th floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766 and 24-hour emergency help is also available through the 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Religious Accommodations

Ohio State's policy reasonably accommodates the sincerely held religious beliefs and practices of all students. Under this policy, students are permitted to be absent for up to three days each academic semester for reasons of faith, religious, or spiritual belief. Students who plan to request accommodations for religious beliefs or practices must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original deadline. These alternative accommodations will remain confidential. However, it is the student's responsibility to ensure that all course assignments are completed.

Accessibility accommodations for students with disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability—including mental health, chronic, or temporary medical conditions—please inform us immediately so we can privately discuss available options. To establish reasonable accommodations, you may be required to register with Student Life Disability Services (SLDS). Once registered, please arrange a meeting with us as soon as possible to discuss your accommodations to ensure timely implementation.

- SLDS Contact Information:
    o Email: slds@osu.edu
    o Phone: 614-292-3307
    o Website: slds.osu.edu
    o Office Location: 098 Baker Hall, 113 W. 12th Avenue

This version improves readability, professionalism, and clarity while keeping the original message intact. Let me know if you need further adjustments!

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Course Schedule

The Discussion Board assignment requires students to post weekly responses. For the Reading Connections & Leading Seminar Discussions assignment, groups will be formed, and presentation dates will be scheduled during class. Students are expected to collaborate within their assigned groups to prepare and deliver their presentations on the selected date. Refer to the CarmenCanvas course for up-to-date due dates.

Week	Course Topic	Workshop Topic	Assignment Assigned	Assignment Due
1	What is Engineering Education	What is a literature review?		
2	The History of the Field - U.S.	Topic Brainstorming		
3	The History of the Field - Global	Lecture search strategies	Literature Trace	
4	Teaching and Learning in Engineering 1	Abstract	Literature Review - Draft	
5	Teaching and Learning in Engineering 2	Introduction		
6	Diversity and inclusion in engineering 1	Methods		Literature Trace
7	Diversity and inclusion in engineering 2	Peer review		
8	Research Methods in EER 1	Peer review		
9	Research Methods in EER 2	Findings - Part 1		Literature Review - Draft
10	Global perspectives on engineering and engineering education	Findings - Part 2	Literature Review - Final	
11	Connecting research to practice in engineering education	Findings - Part 3		
12	Engineering in the workplace	Discussion		
13	Integrating student interests to decide the topic	Peer review		
14	Integrating student interests to decide the topic	Peer review		Literature Review - Final
15	Thanksgiving Break			
16	Literature Review Presentation			Literature Review Presentation