

**From:** [Smith, Randy](#)  
**To:** [Kajfez, Rachel](#)  
**Cc:** [Sutherland, Sue](#); [Reed, Katie](#); [Smith, Randy](#); [Miriti, Maria](#); [Stromberger, Mary](#); [Duffy, Lisa](#); [Hunt, Ryan](#); [Carberry, Adam](#); [Quinzon-Bonello, Rosario](#); [Tomasko, David](#)  
**Subject:** Proposal to establish a Graduate Minor in Engineering Education  
**Date:** Sunday, September 8, 2024 8:19:54 AM  
**Attachments:** [image001.png](#)

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Rachel:

The proposal from the Department of Engineering Education to establish a Graduate Minor in Engineering Education was approved by the Council on Academic Affairs at its meeting on September 4, 2024. Thank you for attending the meeting to respond to questions/comments.

No additional level of internal review/approval is necessary. This action will be included in the Council's next Annual Activities Report to the University Senate (July 2025).

The Office of the University Registrar will work you with any implementation issues.

Please keep a copy of this message for your file on the proposal and I will do the same for the file in the Office of Academic Affairs.

If you have any questions please contact the Chair of the Council, Professor Sue Sutherland (.43), or me.

I wish you success with this new program development.

Randy



**W. Randy Smith, Ph.D.**

Vice Provost for Academic Programs

Office of Academic Affairs

University Square South, 15 E. 15<sup>th</sup> Avenue, Columbus, OH 43201

614-292-5881 Office

[smith.70@osu.edu](mailto:smith.70@osu.edu)

**Assisted by:**

**Katie Reed**

Executive Assistant

(614) 292-5672

[reed.901@osu.edu](mailto:reed.901@osu.edu)

TO: Randy Smith, Vice Provost for Academic Programs

FROM: Graduate School Curriculum Services

DATE: **7/16/2024**

RE: Proposal to **Establish a Graduate Minor in Engineering Education** in the **College of Engineering**

The **Department of Engineering Education** in the **College of Engineering** is proposing a **Graduate Minor in Engineering Education**.

The proposal was received by the Graduate School on **1/11/2024**. The combined GS/CAA subcommittee first reviewed the via E-Vote proposal on **7/01/2024** and requested revisions. Revisions were received on **7/15/2024**. The proposal is recommended for review at CAA.

College of Engineering

3042 Smith Laboratory  
174 W 18th Avenue,  
Columbus, OH 43210  
(614) 292-7923 Phone[eed.osu.edu](http://eed.osu.edu)

July 15, 2024

To Whom It May Concern:

Thank you to the Graduate School – Council on Academic Affairs (GS/CAA) committee for your feedback regarding the Department of Engineering Education’s proposal to establish a graduate minor.

Per your question about why we chose a graduate minor over a certificate, we chose to submit a request to establish a minor because the students who will complete the minor will be enrolled in other programs, predominately in the College of Engineering. It will not be a free-standing program which is an option for a certificate. We see this minor as a supplemental experience opposed to standalone. Also, our peer institutions offer a certificate opposed to a minor because when those opportunities were established, those schools did not have graduate minors (it is our understanding that many still do not have a graduate minor option in general).

Thank you again for your review. Please contact me if you have any additional questions or concerns.

Thank you,  
Sincerely,



Rachel Louis Kajfez, Ph.D.  
Associate Professor of Engineering Education  
Associate Chair for Graduate Studies and Research Infrastructure  
The Ohio State University  
[Department of Engineering Education \(EED\)](http://Department of Engineering Education (EED))  
174 W 18th Avenue, Columbus, OH 43210  
Office: 614-688-2892 Email: [Kajfez.2@osu.edu](mailto:Kajfez.2@osu.edu)



## Memo

To: Dean Maria Miriti, Graduate School  
From: Rosie Quinzon-Bonello, Assistant Dean for Curriculum and Assessment  
Date: January 11, 2024  
Re: Engineering Education Minor proposal

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On January 10, 2024, the College of Engineering Committee for Academic Affairs unanimously approved the Department of Engineering Education's proposal to establish an Engineering Education Graduate Minor.

Attached is the proposal.

Yours sincerely,

  
Rosie Quinzon-Bonello

October 25, 2023

To Whom It May Concern,

The Department of Engineering Education (EED) is pleased to present our proposal to establish a graduate minor in engineering education. This minor is comprised of courses which are already being taught by the EED. Please find the following attached:

- Graduate minor narrative rationale
- Peer institution minor/graduate certificate offerings (Appendix A)
- Letters of support from various OSU engineering departments (Appendix B)

The EED reviewed and unanimously voted to approve this minor at our faculty and staff meeting on April 27, 2023. Thank you for your consideration. If you need any additional information, please contact us.

Sincerely,



Rachel Louis Kajfez, Ph.D.  
Associate Chair for Graduate Studies and Research Infrastructure  
Department of Engineering Education

# Engineering Education Minor

## Narrative Rationale

The Department of Engineering Education (EED) within the College of Engineering proposes to establish a graduate minor in engineering education. Its main audience is current Ohio State Master's and PhD students who are looking to supplement their current experiences at OSU. While the program will be open to all, our specific audience for this minor are graduate students in engineering or STEM interested in academic careers.

The highly successful PhD program in engineering education has been in place since July 2018 and has since graduated 12 PhDs. The program's success is evident in its completion rates (91% to date) and annually increasing application numbers (23 for AU 2023 admission consideration). The courses, co-curricular elements, and faculty advisors are nationally competitive and highly respected. The EED now aims to offer a graduate minor to the Ohio State community for a number of reasons:

- To offer a formal pathway for Master's and PhD students at Ohio State, specifically in the College of Engineering, to augment their technical knowledge and expand their skillset within engineering education as they launch their careers post-graduation
- To remain nationally and internationally competitive with our benchmark engineering education programs, as several other highly ranked programs that also offer graduate minors or certificates in engineering education
- Continue to enhance the EED, by forging connections with students and faculty in other Ohio State departments that have an interest in engineering education

The EED is confident in its ability to attract students to the minor. A number of current and past College of Engineering graduate students outside of the EED have expressed to both faculty and staff their interest in pursuing a graduate minor in engineering education. ENGREDU graduate courses are currently taken by graduate students outside of EED, from both the College of Engineering and the College of Education and Human Ecology. Providing a minor will allow a transcriptable option for these students.

To connect with prospective students directly, we will launch an initial email campaign promoting the graduate minor to current graduate students in the College of Engineering and advertise to the graduate program coordinators in the College of Engineering and College of Education and Human Ecology. We will also advertise the new graduate minor at College of Engineering recruitment events for new students and at other events we engage in throughout the college (e.g., if our faculty give a seminar in another department, they will advertise the minor). We will also post information about the minor on our Twitter and Facebook accounts periodically. We will update our website to include information about the minor, and we will post flyers in targeted engineering buildings on campus.

### *Proposed Curriculum*

The EED offers various core graduate courses to its current PhD students; we propose the following two courses be *required* for successful completion of the graduate minor:

ENGREDU 6200: Learning Theory, Pedagogy, and Assessment (3 credits)

ENGREDU 7881: Seminar in Engineering Education (1 credit)

Electives must include at least 6 additional hours of the following ENGREDU/ENGR courses, per the Ohio State guidelines on graduate minor requirements (please note that the ENGR courses listed below are taught by faculty from the EED):

ENGREDU 6100: Foundations in the Field of Engineering Education (3 credits)

ENGREDU 7780: Research Design in Engineering Education (3 credits)  
ENGR 7710: Engineering Research Communications (3 credits)  
ENGREDU 7189.01: Teaching Preparation and Support (2 credits)  
ENGREDU 7189.02: Professional Development in College Teaching (1 credit)

All of the above courses are expected to be held in-person.

### *Anticipated Benefits for Participants*

The department anticipates multiple benefits for students who enroll in the graduate minor in engineering education. First, students will gain an understanding of critical issues facing engineering education and will be able to translate that to their educational contexts. Students will also come away with knowledge of course and curricular design along with best practices in assessment that will enhance their ability to work in educational contexts during graduate school or in their future careers. Finally, students will have an opportunity to refine their interests by taking elective courses which can focus on research design, technical writing, teaching practices, and more as we will include offerings of new group studies courses as allowable electives for students pursuing the minor.

### *Learning Outcomes and Proficiencies for Students*

The following learning outcomes will be met as students successfully complete the two required courses for the graduate minor in engineering education. These objectives were developed through an extensive curriculum design institute with the Drake Institute for Teaching and Learning that was conducted to develop the PhD program from which this minor is pulling courses. Additional objectives will be completed in the elective courses; however, those will be variable based on the students' selection of courses.

ENGREDU 6200: Learning Theory, Pedagogy, and Assessment (3 credits)

- 3.A.(i). Discuss expert and novice learner similarities and differences
- 3.C.(i). Create appropriate learning outcomes
- 3.C.(ii). Apply evidence-based learning strategies
- 3.C.(iii). Design a learning plan
- 3.D.(i). Design an assessment plan aligned with learning outcomes
- 3.D.(ii). Develop an instructional plan aligned with assessment plan and learning outcomes
- 3.D.(iii). Develop a course syllabus and discuss the choices made founded in learning theory explicitly addressing stakeholder needs
- 4.B.(ii). Connect appropriately cited examples, facts, or theories from more than one field of study or perspective to create value
- 4.B.(iii). Craft a well-supported argument including claims, reasons, and evidence by citing scholarly references from more than one field of study, appropriate to the intended audience
- 4.D.(i). Give constructive feedback
- 4.D.(ii). Improve professional communications based on feedback from multiple sources
- 4.D.(iii). Prepare professional communications (e.g., written documents, oral presentations, proposals, lesson plans, portfolios, job application materials) appropriate to a variety of audiences
- 4.F.(i). Critique a project management plan
- 4.F.(ii). Develop a project management plan including primary constraints (e.g., scope, schedule, budget, and quality)

ENGREDU 7881: Seminar in Engineering Education (1 credit)

- 1.C.(ii). Interpret the needs of primary stakeholders in a given initiative within engineering education
- 2.A.(ii). Reflect critically on research across various fields that targets diverse audiences

- 2.E.(ii). Evaluate the quality of research
- 4.A.(ii). Analyze examples of social injustice at both the individual and systemic levels
- 4.C.(ii). Participate effectively on a diverse, multidisciplinary team
- 4.E.(ii). Articulate broad ethical implications of engineering education research and practice

*Letters of Support*

We have asked the other departments in the College of Engineering for their support of this minor as we are targeting enrollment mostly from students in their programs. Evidence of their support is included in the form of letters from the following departments: Biomedical Engineering, Computer Science and Engineering, Food, Agricultural and Biological Engineering, and Integrated Systems Engineering.



## Engineering Education Graduate Minor: Advising Sheet

### EED Graduate Minor Program Advising Sheet (*Proposed*)

Student Name \_\_\_\_\_

Home Department \_\_\_\_\_

#### Required Coursework (4 credit hours)

Required:	Semester	Grade	Credit
ENGREDU 6200 Learning Theory, Pedagogy, and Assessment (3 credits)	_____	_____	_____
ENGREDU 7881 Seminar in Engineering Education (1 credit)	_____	_____	_____

#### Elective Coursework (6 credit hours):

Courses:	Semester	Grade	Credit
ENGREDU 6100 Foundations in the Field of Engineering Education (3 credits)	_____	_____	_____
ENGREDU 7780 Research Design in Engineering Education (3 credits)	_____	_____	_____
ENGREDU 7710 Engineering Research Communications (3 credits)	_____	_____	_____
ENGREDU 7189.01 Teaching Preparation and Support (2 credits)	_____	_____	_____
ENGREDU 7189.02 Professional Development In College Teaching (1 credit)	_____	_____	_____

#### Notes:

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## Appendix A

### Peer Institution Graduate Minor/Certificate Programs

## Peer Institution Graduate Minor/Certificate Programs

Institution	Minor/Cert	Minimum Total Credits	Courses Required
<a href="#">Virginia Tech</a>	Graduate Certificate	12	Issues in Engineering Education (2 credits) Grad Student Success in Multicultural Environments (1 credit) Applied Design & Assessment (3 credits) Elective Courses (6 credits)
<a href="#">Purdue University</a>	Graduate Certificate	10	Content, Courses, and Pedagogy (3 credits) Engineering Education Methods (3 credits) Mentored Teaching in Engineering (1 credit) Succeeding as Engineering Professor or Exploring Alternative Career Paths (each 3 credits)
<a href="#">Clemson University</a>	Graduate Certificate	11	Pedagogy (3 credits) Professional Preparation (3 credits) Research Methods (3 credits) Practicum (1 credit) Seminar (1 credit)
<a href="#">University of Texas</a>	Graduate Certificate	16	Teaching Engineering (3 credits) Curriculum Design and Assessment (3 credits) Elective in Educ or Eng Educ (3 credits) Teaching Practicum (6 credits) Teaching Portfolio (1 credit)
<a href="#">University of Tennessee</a>	Graduate Certificate	12	Education Theory for Research & Practice (3 credits) Engineering Instruction & Practice (3 credits) Research Methods (3 credits) Elective (3 credits)
<a href="#">University of Texas-San Antonio</a>	Graduate Certificate	9	Engineering Education Methods (3 credits) Mentored Teaching in Engineering (3 credits) Special Problems: Becoming an Engineering Educator/Professor (3 credits)

<a href="#">University of Florida</a>	Graduate Certificate	9	Research Methods Course (3 credits) Foundations of Engineering Education (3 credits) Learning and Teaching in Engineering (1 credit) Supervised Teaching (2 credits)
<a href="#">University of Michigan</a>	Graduate Certificate	12	Foundations of EER (3 credits) Theoretical and Conceptual Frameworks in EER (3 credits) Research Methods Course (3-5 credits) Research Project (3 credits)

## Appendix B

### Letters of Support



THE OHIO STATE UNIVERSITY

**Jun Liu, Ph.D.**

Professor and Director of Graduate Studies

Department of Biomedical Engineering  
4002 Fontana Labs  
140 W. 19th Ave  
The Ohio State University  
Columbus, OH 43210  
Liu.314@osu.edu  
614-247-8904

*September 11, 2023*

Dear Review Committee,

The Department of Biomedical Engineering in the College of Engineering at The Ohio State University supports the creation of a minor in engineering education by the Department of Engineering Education. As outlined in the proposal, we believe the engineering students in our program who are interested in academic careers will benefit from such a minor. In the future, we will advertise this minor to our students as needed.

Sincerely,

Jun Liu, PhD



THE OHIO STATE UNIVERSITY

**College of Engineering**

Department of Computer Science and Engineering

395 Drees Laboratories

2015 Neil Avenue

Columbus, OH 43210-1277

Phone (614) 292-5813

Fax (614) 292-2911

[www.cse.osu.edu](http://www.cse.osu.edu)

September 12, 2023

Dear Review Committee,

The Department of Computer Science and Engineering in the College of Engineering at The Ohio State University supports the creation of a minor in engineering education by the Department of Engineering Education. As outlined in the proposal, we believe the engineering students in our program who interested in academic careers will benefit from such a minor. In the future, we will advertise this minor to our students as needed.

Sincerely,

*Feng Qin*

Feng Qin, Professor  
Chair of Graduate Studies Committee  
Department of Computer Science and Engineering  
The Ohio State University



**THE OHIO STATE UNIVERSITY**

**Department of Food, Agricultural  
And Biological Engineering**

590 Woody Hayes Drive  
Columbus, OH 43210-1057

Phone +1-614-292-3508  
FAX +1-614-292-9448  
Email <sastry.2@osu.edu>

September 28, 2023

To Whom It May Concern:

The Graduate Program of the Department of Food, Agricultural and Biological Engineering in the College of Engineering at The Ohio State University supports the creation of a Graduate Minor in Engineering Education by the Department of Engineering Education. As outlined in the proposal, we believe the engineering students in our program who interested in academic careers will benefit from such a minor. In the future, we will advertise this minor to our students as needed.

Sincerely,

**Sudhir Sastry**  
Distinguished Professor of Food, Agricultural and Environmental Sciences in Food  
Engineering  
Graduate Studies Chair, Department of Food, Agricultural and Biological Engineering



Dear Review Committee,

The Industrial and Systems Engineering Program, within the Integrated Systems Engineering Department supports the creation of a minor in engineering education by the Department of Engineering Education. As outlined in the proposal, we believe the engineering students in our program who interested in academic careers will strongly benefit from such a minor as currently their program is focused on the research component of a future academic career and there is very little focus on the teaching component of this career track. In the future, we will advertise this minor to our students as needed.

Sincerely,



Steve Lavender, Ph.D.,CPE  
Professor, Associate Chair, & Graduate Studies Chair