Purdue has been a powerhouse for educating engineers for more than 140 years, but the ACADEMIC STUDY of how best to educate engineers has emerged in just the past few decades. Determined to lead in the discipline, in 2004 Purdue established the School of Engineering Education, the WORLD’S FIRST SUCH ACADEMIC UNIT, and, along with it, the WORLD’S FIRST ENGINEERING EDUCATION GRADUATE PROGRAM.

At Purdue, an enthusiastic and committed community of scholars (including 24+ faculty members) is developing a research base for guiding engineering education by experimenting with new teaching methods, developing curricula, assessing how students learn, and moving those findings into the classrooms of tomorrow’s engineers. THE ULTIMATE GOAL? To educate engineering leaders who can respond creatively and responsibly to 21st-century challenges.
Engineering Education at Purdue University

NATIONAL REPUTATION of our faculty, students, and graduate program as agents of change. The American Society for Engineering Education, the National Academy of Engineering, the National Science Foundation, and others have recognized Purdue Engineering Education’s leadership, honored our scholarship, and/or funded our research.

LIVING LABORATORIES for teaching and research including our First-Year Engineering Program, our Multidisciplinary Engineering Program, and our INSPIRE Research Institute for Pre-College Engineering.

PERSONALIZED PROGRAM to accommodate your interests, background, and career aspirations. Our program draws from many disciplines, and we actively seek students across a range of academic interests and life experiences.

RESEARCH SEMINAR SERIES to learn and share with your colleagues at Purdue and beyond—what you are doing to define and advance engineering education. Weekly presentations foster community-building and provide opportunities for professional development.

COLLABORATIVE, INCLUSIVE ENVIRONMENT Our graduate program attracts faculty and students from across the country and around the world into a welcoming and supportive community.

FULLY FUNDED PHD PROGRAM Students are fully funded with stipends and tuition through research and teaching assistantships or fellowships. In our program, you can focus on your studies and not worry about your finances.

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PURDUE UNIVERSITY FACTS AND FIGURES
1869 Purdue was founded as a land-grant institution
40,000 students enroll yearly at West Lafayette campus
3,000 tenured/tenure-track and non-tenure faculty
400 research labs on the West Lafayette campus

#1 DESTINATION FOR INTERNATIONAL STUDENTS IN STEM DISCIPLINES U.S. DEPT. OF HOMELAND SECURITY

+20% INCREASE for retention of UNDERREPRESENTED MINORITIES in the last decade

+83% INCREASE for enrollment of UNDERREPRESENTED MINORITIES in First-Year Engineering in the last decade

+51% INCREASE for enrollment of FEMALE UNDERGRADUATES in the last decade
With a PhD in engineering education, your career opportunities vary widely, from academia to non-profit work to industry to government and policy.

**SAMPLING OF CAREER PATHS**
- faculty member in engineering
- faculty member in engineering education or STEM education
- director of university teaching and learning center
- higher-education liaisons to industry (philanthropy, recruitment, development, etc.)
- P-12 educators and administrators
- workforce development and training
- trainers and human resource managers in industry and nonprofit organizations
- informal engineering educators in nonprofit settings (e.g., museums, science centers)
- consultants and entrepreneurs

**DISSERTATION: A Multi-Phase Exploration of Conceptualizations, Perceived Importance, and the Development of Empathy within Engineering**

Dr. Justin Hess
ENE PhD ‘15

I am the Assistant Director in the STEM Education Innovation and Research Institute (SEIRI) at IUPUI. I officially started in this position in December of 2016, after serving as a postdoc at SEIRI for nearly a year. Prior to this, I worked as a postdoc on an Ethics Education in Science and Engineering grant at Purdue out of Biomedical Engineering, led by Dr. Andrew Brightman. This was a grant that I had served on at Purdue while working on my dissertation.

In my current position, I work closely with faculty from various backgrounds at IUPUI, but with a concerted effort towards improving STEM curricula.

What I have found most helpful from my ENE work is the BREADTH OF METHODOLOGICAL EXPERTISE that I developed. In SEIRI, when I engage faculty members in a dialogue about the best ways they might evaluate or assess their courses, there isn’t generally a one-size-fits-all solution. Nonetheless, based on work that I conducted, the conversations that I had, and all the expertise that was shared by our ENE faculty, I generally feel confident working with faculty members no matter the scope of their project.
**Academic Requirements**

Graduate students in Engineering Education typically enter the program with a bachelor’s or master’s degree in engineering or other STEM fields. As a graduate student, you’ll follow a curriculum that provides a holistic educational experience that attends to your professional development.

**COURSE REQUIREMENTS**

- **Engineering Education Foundations**, a set of courses introducing you to our interdisciplinary program and integrating engineering and education concepts
- **Technical Engineering** coursework to develop depth of understanding of engineering concepts
- **Research Preparation** covering a range of approaches to engineering education research and guidance in developing methods for your dissertation
- **Engineering Education Specialization** focusing on developing your areas of expertise

**Transfer Requirements**

You will develop and demonstrate the ability to create and synthesize knowledge, think critically and reflectively; master written and oral communication skills; demonstrate engineering skills, engage in professional development; participate actively in a professional field or engineering education; teach engineering; and apply your knowledge of instruction, curriculum design, and assessment of engineering science, problem-solving, and design.

**Frequently Asked Questions**

- **How long is the program?**
  As you might suspect, it is hard to estimate time to degree, especially in light of individual variations in prior credit transfers, semester coursework load, research pace, etc. Our students entering the program without a master’s degree have typically graduated within 4-6 years. Those entering the program without a master’s degree are more likely to complete their PhD in 4-6 years. Our website has a great PhD timeline and milestones that will walk you through the PhD degree process.

- **Are there options for an online or distance-learning program?**
  The School of Engineering Education PhD in Engineering Education requires students be on campus for the 32 credit hours of foundation courses. These courses are not offered in a distance-learning format, although some online elective courses may be available. Once coursework is complete, students may work individually with their advisors to explore options for living and working away from campus.

- **Do I need an engineering background to apply?**
  Not strictly. However, those with undergraduate or graduate degrees other than engineering may be required to take additional engineering coursework if admitted. Students in the program typically have at least one prior degree in a STEM (science, technology, engineering and mathematics) discipline.
Admission Information

All students apply through the Purdue Graduate School and not directly to our school. All requirements, including for both domestic and international students, are included on the Graduate School’s website.

The Engineering Education Graduate Program Committee begins looking at the applications as they come in, so earlier submissions are encouraged. Applications are ranked in several different areas with the highest-ranking students being eligible for College of Engineering or Graduate School fellowships. The graduate committee will notify accepted students pending the decision of the Purdue Graduate School by the end of February or beginning of March of the application cycle.

APPLICATION DEADLINE IS DECEMBER 15

See the Graduate School website for more information about the following requirements:
- Transcripts
- GRE Test
- English Proficiency (TOEFL or IELTS)
- Recommendation Letters
- Statement of Purpose
- Engineering Education Research Statement

FOR QUESTIONS AND ONLINE APPLICATION PROCESS
PURDUE.EDU/GRAD SCHOOL

Frequently Asked Questions

What is the cost for the program?

PhD students pay fees of $865.00* for the academic fall and spring semesters and $432.50* (half of regular fees) for the summer term. International students pay an additional $80* fee per semester.

*Fees subject to change.

What types of funding opportunities are available as a graduate student in the program?

The School of Engineering Education funds ENE PhD students for their first semester. Late in the fall semester, students and faculty members are matched, and then students are typically funded on research grants. Some students may also be supported through teaching and/or other types of assistantships or fellowships during pursuit of their degree. To date, all of our entering students have been funded.

Visit our website and YouTube channel for specific questions and pre-recorded help sessions.
purdue.edu/ENE

Join our mailing list to receive e-mails for opportunities to learn more about the program and application process.

Join us for webinars to answer frequently asked questions about the application process and graduate program.

Plan a visit to campus and attend our annual fall GRADUATE PROGRAM OPEN HOUSE.
SEE WEBSITE FOR DATES AND DETAILS.
The School of Engineering Education’s extensive research portfolio offers national leadership in building the scholarly discipline of engineering education, and it provides a strong foundation for our graduate program and INSPIRE (Research Institute for Pre-College Engineering). Research areas span a range of categories.

Here are some research areas explored by faculty and graduate students at Purdue University’s School of Engineering Education:

**Engineering Ways of Thinking, Knowing, and Doing**
- engineering epistemologies
- intuitive expertise in engineering context
- design thinking and engineering decision-making
- global engineering and international perspectives
- mathematical thinking
- theory and working in multi-, inter-, and transdisciplinary ways
- engineering practice

**Knowing Our Students**
- diversity (race, ethnicity, socioeconomic status, and gender)
- large-scale data analytics
- motivation and careers in STEM fields
- P-12 engineering education
- recruitment, retention, and student success
- self-efficacy and career identity building

**Supporting and Assessing Engineering Learning**
- conceptual change and concept inventories
- cyberlearning and cyber-environments
- design of learning environments
- instrument design and survey development
- learning in out-of-school and informal environments
- models and modeling
- service and experiential learning
- teaming and collaborative learning

**Transforming Engineering Education Systems**
- theories of change for engineering education
- history and nature of engineering leadership and policy
- evaluation of the engineering education research community
- faculty and graduate student professional development

**Frequently Asked Questions**

**What types of research are available?**

Do I need to know what research I want to conduct before I apply or accept?

We do not designate areas of research in the application process. Engineering education research is still an emerging field with a wide range of research topics and continues to grow based on our students’ interests. Preview some of our alumni research profiles or review our alumni list and their dissertations. Each will provide a great overview of the types of engineering education research that have been conducted in the past.

**Meet Molly**

In my last professional role before returning to graduate school, I worked as a senior engineer in air quality. I provided technical and analytical support to clients in a variety of industries, but knew that my true passion was to eventually research and teach engineering students. My dissertation research focuses on student design trade-off decisions through the study of their design actions and thinking. I have taken so much of what I learned in industry to make me a more effective educator and more grounded researcher.
Meet Our Faculty

Robin Adams
ASSOCIATE PROFESSOR

Interdisciplinary thinking and learning; networking and technology; globalization and technology; engineering education; leadership and management; strategic planning.

Edward Berger
ASSOCIATE PROFESSOR

Teaching with technology; engineering education; minority outreach; student success; supporting faculty; student recruitment.

Sean Brophy
ASSOCIATE PROFESSOR

Adaptation; creativity in technology; interdisciplinary thinking; learning and teaching; teaching with technology.

Monica Cardella
DIRECTOR OF INSPIRE

Engineering learning in traditional settings; design and business in engineering; pre-college engineering education; engineering design.

Meet Juan

Both my bachelor’s and master’s degrees are in process engineering. After six years in industry, while also serving as an adjunct professor, a faculty position opened at my home institution. I decided to go full time into academia, applied for the position, and landed it. After taking the position as a full-time instructor, the university required me to get a PhD. At that time, I thought I would pursue something in my discipline. However, a posterior experience as the head of the process engineering department at the same institution changed my perspective. The engineering school at my university had many PhD faculty in disciplinary areas but no one was formally trained in education. This situation manifested itself in many different ways, including less favorable student evaluations and the concerns of colleagues. This change in perspective helped me decide to go for a PhD in something related to engineering education so I could do more for the university. I just wasn’t sure if such a program even existed.

PURDUE UNIVERSITY

In Colombia, I met a Purdue faculty member who came to speak at my home university about technology in education. She happened to be a graduate from the same institution. After the presentation, I had a conversation with her about the programs she was doing in Colombia. She mentioned that she was working on a Ph.D. program in education and wanted to come back to Purdue to do research. As a result, I learned that few other universities offered similar programs. To me, Purdue was a natural choice given the existing ties between my institution and my home country. I couldn’t have been luckier. Purdue was the first institution to offer into offer a Ph.D. program in engineering education.

At my home institution, we train engineers engineering mostly as we were trained. We have the disciplinary knowledge and our faculty is literate in their fields but I don’t think we have enough formal training in how to teach engineering. As a result, my research deals a lot with professional development. I designed a workshop for engineering faculty at the institution that I piloted last summer (2016). It got positive feedback and sparked a lot of interest. My research focus has been how to use educational inquiry as a means to contribute to research productivity, especially by the way we teach, and how can we help balance the demands of research and teaching so they contribute to each other? Once I return to Colombia, my long-term goal is to foster the creation of a community of people interested in joining me around the field of engineering education and engineering education research.

Meet Juan

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First-Year Engineering Students

Students experience a team-based, inquiry-based project on the first day of their first engineering course at Purdue University.

Allison Godwin
Assistant Professor
Identity development of diverse engineers; Characterizing latent diversity; Student development early in the first year; How students at the intersections of multiple social identities experience engineering culture and navigate their identities as engineers; How non-cognitive factors impact student success; Mixed methods research

Morgan Hynes
Assistant Professor
Diversity and Inclusion in Engineering; Humanistic Engineering; Pre-College Engineering Education; Engineering Design

Michael Loui
Dale and Suzi Gallagher Professor in Engineering Education
Motivation and persistence in engineering students; Identity development and effective outcomes; Ethics in engineering and computing

Brent Jesiek
Graduate Program Chair
Robotic and system safety of engineering, engineering education, and computing; Global engineering education; Engineering ethics and social responsibility

Krishna Madhavan
Associate Professor
Cyberinfrastructure for engineering education research; Cyberlearning; Virtual and immersive environments; Large-scale data mining tools for engineering education research

Muhsin Menekse
Assistant Professor
Students’ conceptual understanding in engineering and science; Students’ educational outcomes; Technology-enhanced learning environments

Joyce Main
Assistant Professor
Student motivation, and self-efficacy; Advising and mentoring; Students in science and engineering; Global engineering; Social and professional development; Higher education; Education policy

Tamara Moore
Assistant Professor
How engineering and engineering thinking promote learning in K-12 classrooms; Building mathematics and science classrooms as well as higher education engineering laboratories, through the promotion of STEM integration; Support and professional development; Mathematics and science as a means for STEM integration

Seng-Liang Wang Hall
Interdisciplinary Engineering Education Research Laboratory

This innovative, 24/7-secured laboratory provides our community a one-of-a-kind dedicated space to conduct groundbreaking research in engineering education.

Seng-Liang Wang Hall
Engineering Education Research Laboratory
Third Floor

Smart Suites
Collaboration Suites
Observation Lab
Simulation Classrooms
Interview Rooms
Commons Area
Quiet Room

2015 LABORATORY OPENED
17,000 SQUARE FEET

Students’ Countries of Origin
AY 2017-2018

China, Iran, Jordan, Mexico, Nigeria, Saudi Arabia, South Korea, Spain

Student Gender Ratio
AY 2017-2018

34 Females
39 Males
73 CURRENT GRADUATE STUDENTS

For more information about our faculty research and alumni highlights, visit our website.
Engineering Education Explorer Fellowship

The School of Engineering Education (ENE) Explorer Fellowship provides students with departmental funding for their first semester of graduate study. The major goals of this program are to provide students with a practical, hands-on introduction to research and scholarship in engineering education, while giving them ample time to get to know our faculty and identify prospective advisors.

The first weeks of the Explorer experience focus on projects related to the assessment and programmatic improvement of the First-Year Engineering (FYE) program. These projects are designed to be relatively small, introductory, and exploratory, and they provide the FYE program with data, interpretations, and guidance related to a variety of issues. For the rest of the semester, students are assigned to work with a faculty member on a specific project. These placements are made based on input from faculty and students, and are intended to provide more in-depth exposure to engineering education research. During their Explorer experience, students may be exposed to quantitative and/or qualitative data and methods, depending on their own preferences and the specific needs of faculty.

During October and November of their first semester, students and faculty also participate in a formal advisor-advisee matching process. From their second semester onward, students are encouraged to get to know our faculty and identify prospective advisors.

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Dr. Ahn is an Assistant Professor in Aerospace Engineering at Iowa State University. His work brings student-centered pedagogy to large mechanical engineering classes. While at Purdue, Dr. Ahn's research looked at how graduate students and postdoctoral researchers mentor undergraduate engineering students. Before he joined the Engineering Education Graduate Program, he was pursuing his master's degree in aeronautics and astronautics engineering at Purdue. While participating as a teaching assistant in the First-Year Engineering Program, he became very interested in working with undergraduate students and how engineering education research can be implemented in real classroom settings.

DISSERTATION: Creation of an instrument to measure graduate student and postdoctoral mentoring abilities in engineering and science undergraduate research settings.
CityBus, the public transportation bus system for the cities of Lafayette and West Lafayette, is a contracted partner with Purdue University for public transportation services. The unlimited access agreement gives Purdue students, faculty, and staff fare-free access to the CityBus system for both cities - residential and shopping areas.

Starting in 2015, Purdue partnered with Alcoa Foundation to bring bike sharing to campus. Zagster bike stations are set up throughout campus and bikes can be rented using a yearly membership or the purchase of a 24-hour pass. Purdue’s recently improved bike paths allow quick travel around campus.

Garage and street parking are available for vehicles on campus. Students must purchase a yearly parking permit.

Purdue University’s West Lafayette campus is located between two major cities - Indianapolis, Indiana, and Chicago, Illinois - both with international airports and convenient shuttle services both directions.

**INDIANAPOLIS TO PURDUE**
- Indianapolis International Airport IND
- 66 miles ~1hr 10m
- Lafayette Limo and Star America Shuttle Services

**CHICAGO TO PURDUE**
- Chicago Midway International Airport MDW
- O’Hare International Airport ORD
- 140 miles ~2h 45m
- Express Air Coach, Lafayette Limo, and Reindeer Shuttle Services
Purdue engineering graduate students can also earn a graduate certificate while in the program. The purpose of the **TEACHING AND LEARNING IN ENGINEERING GRADUATE CERTIFICATE** is to enhance the preparation of doctoral students in engineering for academic careers. The courses in the certificate program provide students who wish to become faculty members with the tools they need to be change agents with respect to the employment of best teaching and learning practices in engineering.

By design, the course content provides College of Engineering graduate students with an added edge in the competitive market for assistant professor positions and will aid in their transition into academia.

**Graduate Certificate**

Purdue engineering graduate students can also earn a graduate certificate while in the program. The purpose of the **TEACHING AND LEARNING IN ENGINEERING GRADUATE CERTIFICATE** is to enhance the preparation of doctoral students in engineering for academic careers. The courses in the certificate program provide students who wish to become faculty members with the tools they need to be change agents with respect to the employment of best teaching and learning practices in engineering.

By design, the course content provides College of Engineering graduate students with an added edge in the competitive market for assistant professor positions and will aid in their transition into academia.

**ADMISSION REQUIREMENTS**

A student must be enrolled in a graduate program in the College of Engineering at Purdue University to be admitted into and receive the certificate. A graduate student majoring in Engineering Education or any other Engineering program at Purdue University may complete the certificate.

To be admitted into the certificate program, a student must have:

- A bachelor’s degree from an accredited institution.
- A minimum undergraduate GPA of 3.0/4.0 with the possibility of conditional admission for applicants who do not meet this requirement.

A Minimum TOEFL score of 550 or higher on the paper-based test, or 77 or higher on the Internet-based test (iBT), is required for applicants whose native language is not English. Applicants who take the TOEFL iBT must achieve the following minimum test scores, in addition to the overall required score of at least 77: reading, 19; listening, 14; speaking, 18, and writing, 18. Applicants taking the IELTS must score at least 6.5 on the Academic Module. Applicants taking the PTE must score at least 58.

**COURSES**

- **ENE 50600 – Content, Assessment And Pedagogy: An Integrated Engineering Design Approach** (3 credit hours) This course is designed to help students apply an engineering design approach to instruction.
- **ENE 68500 – Educational Methods in Engineering** (3 credit hours) This course focuses on research-informed and very practical day-to-day aspects of teaching.
- **ENE 68700 – Mentored Teaching in Engineering** (1 credit hour) This course enables graduate students to deepen their understanding of college teaching and learning through a semester-long teaching experience with mentoring, feedback, and reflection.
- **ENE 69500 – Succeeding as an Engineering Professor** (3 credit hours) This course is designed provide students with an opportunity to learn and practice the skills that complement and enhance teaching and learning in a tenure-track faculty position, including funding and setting up and managing a research lab.