



IOWA STATE  
UNIVERSITY

Department of Electrical  
and Computer Engineering

# Strategic Plan

2018-2023

## ***ECpE: The Future is What We Do***

The Department of Electrical and Computer Engineering (ECpE) at Iowa State follows the university's vision of leading the world in advancing the land-grant ideals of putting science, technology, and human creativity to work. To do this, we value hands-on learning, asking our students to engage in real-world opportunities and cutting-edge research. We foster a culture of excellence and invest in our students, faculty and staff. We are at the core of this rapidly changing smart world, and through our strategic plan, we will work to create a better world for all.





The Department of Electrical and Computer Engineering (ECpE) at Iowa State University (ISU) is at the forefront of education and cutting-edge research in electrical and computer engineering disciplines. Being the largest of eight departments in ISU's College of Engineering, it is the birthplace of the modern digital computer, with over 100 years of educating generations of ECpE engineers who have pioneered technologies and influenced economies and societies worldwide. The ECpE department assumes a critical role in helping ISU and its College of Engineering achieve its vision of providing excellence and value in engineering education, research, and engagement among land-grant institutions, making Iowa and the world a better place to live. The department emphasizes learning by doing and mentors its students to engage them in solving real-world challenges, gain leadership experiences and explore ways to solve problems at an international level, as engineering is a global field.

To continue making these contributions and steer the department in the coming years to fulfill its education, research, and land-grant mission, this strategic plan outlines the vision of faculty, staff, students, and department stakeholders. The following key areas are crucial to the department's prosperity in the coming years:

- Diversity and Inclusion
- Undergraduate Education
- Graduate Education
- Research
- Outreach and Engagement
- Resources

In the following, strategic objectives and corresponding action items are identified for each of these areas. Diversity and inclusivity are central to all aspects of department functions.



## Vision

We aim to be recognized as a leading department of Electrical and Computer Engineering among land-grant universities and be known around the world for the quality and originality of our research, for academic excellence, for value in education, and for our commitment to engagement with society.

## Mission

- Our faculty and staff will develop, share, and apply knowledge in electrical, computer, software, and cyber security engineering. They will be creative and innovative and be recognized for having an impact that benefits society and furthers Iowa State University's land-grant mission.
- We will educate our students in the fundamentals of electrical, computer, software, and cyber security engineering, enabling them to engage in lifelong learning so they can adapt to technological advances and become leaders who shape the future of our discipline.
- We will conduct innovative and interdisciplinary research to create and apply new knowledge and improve understanding.
- We will engage with partners in industry, government, and academia in Iowa and the United States and around the world.
- We will encourage and support a diverse and inclusive educational and working environment that promotes creativity in research, scholarship, and learning.





## Diversity and Inclusion

*Our commitment to a diverse and inclusive environment*

### Strategic Objectives

- Proactively establish an inclusive environment for students, faculty, and staff
- Promote and ensure diversity of people and ideas among all constituent groups in the department

### Key Actions

- We will strive to build a critical mass of diverse talent in the department, representative of all forms of diversity, by recruiting and retaining outstanding faculty, staff, and students.
- We will promote inclusive practices and multicultural competencies in our education, research, and engagement programs.
- We will create welcoming educational and work environments and spaces in which differences in backgrounds and perspectives are valued and respected and every individual feels a sense of belonging.
- We will cultivate diversity, equity, and inclusion awareness skills through training and educational opportunities and resources.
- We will partner with internal and external stakeholders and draw on guidance from professional organizations and the engineering education community to enhance our efforts.





# Undergraduate Education

*Our promise to our undergraduate students*

## Strategic Objectives

- Develop undergraduate curricula that respond to industrial and societal needs through agile and flexible education
- Train professionally and ethically well-grounded students, giving them a comprehensive knowledge of fundamental concepts in the respective degree programs

## Key Actions

- We will provide an educational experience for our students that focuses on understanding of fundamental concepts, connectivity of subject matter across courses, and synthesis of knowledge through meaningful laboratory and design experiences.
- We will ensure that our educational programs are approved by ABET and other relevant accrediting bodies.
- We will strengthen existing collaborations on interdisciplinary courses and programs and promote active participation of our faculty.
- We will increase our engagement with industry stakeholders in developing our educational programs.
- We will promote recognition and incentives for faculty who apply evidence-based scholarly practices in the curriculum and who engage in the scholarship of teaching and learning.





# Graduate Education

*Our pledge to our graduate students*

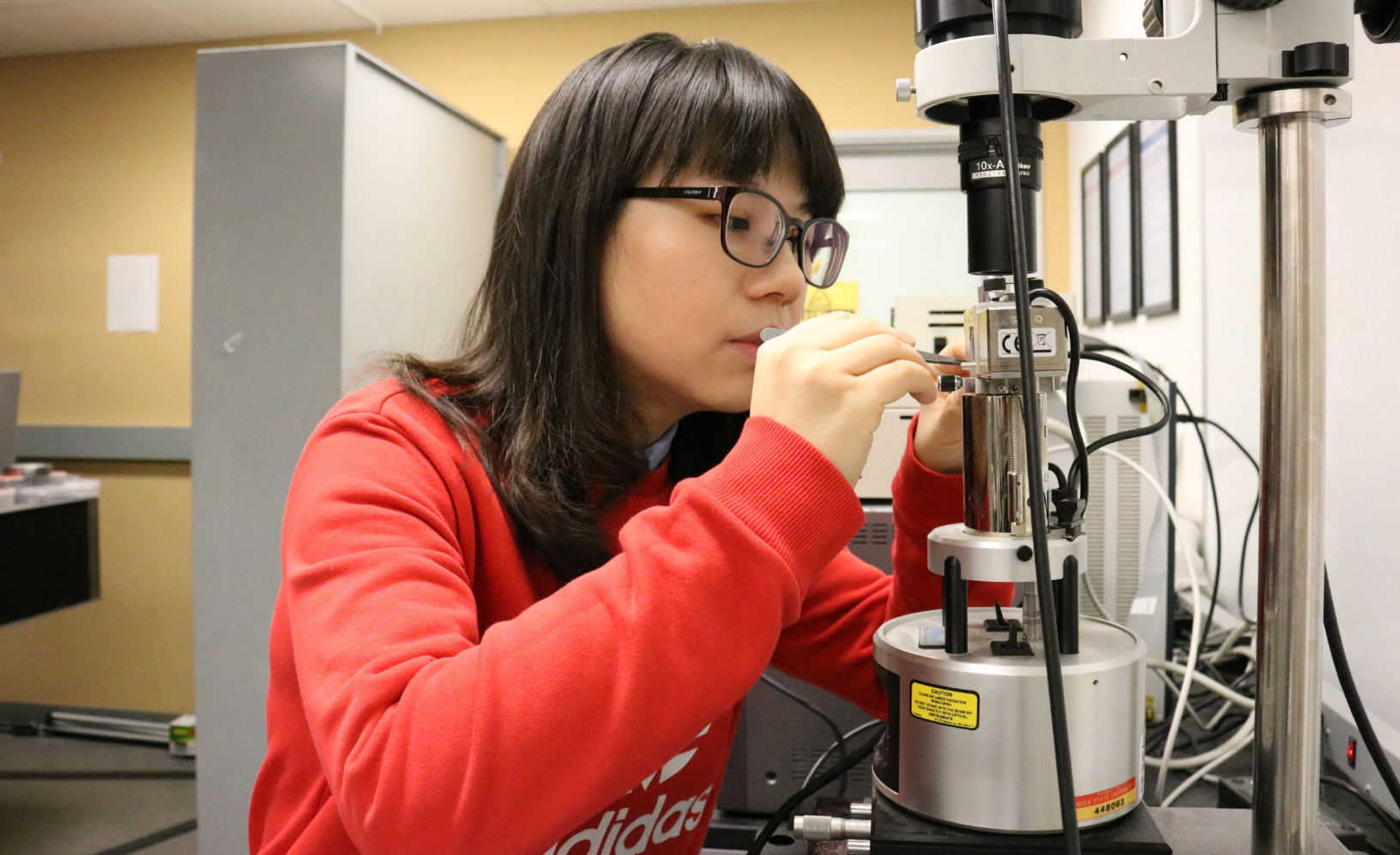
## Strategic Objectives

- Develop and strengthen an internationally recognized premier graduate program that prepares students to be successful leaders in their professions
- Provide a comprehensive educational experience for graduate students that balances developing research skills in recognized areas and educating students to become critical thinkers to solve the problems of the future

## Key Actions

- We will proactively recruit domestic and international students and use scholarships to attract the best students.
- We will regularly update and develop graduate courses in emerging areas and collaborate with other departments on campus to expand interdisciplinary programs.
- We will broaden our online programs and effectively use technology and modern pedagogical tools to enhance their delivery and availability.
- We will enrich our graduate student mentoring programs to improve students' communication skills and help them pursue research and development careers in academia and industry.
- We will establish partnerships with industries to facilitate graduate student internships and training.





## Research

*Our pursuit of solving grand societal challenges*

### Strategic Objectives

- Create knowledge that makes the world and humanity better through innovative research
- Pursue impactful, interdisciplinary research that solves important problems of today and develops vision for tomorrow

### Key Actions

- We will diversify our funding stream and enhance interactions with industry and government agencies to advance research activities.
- We will engage in and lead multi-university research programs and centers.
- We will improve research infrastructure by seeking funding from federal, industrial, and philanthropic sources.
- We will enhance our research scholarship by publishing in flagship forums and engaging in professional leadership roles.
- We will expand research on engineering education by leveraging federal, state, and industry initiatives.





# Outreach and Engagement

*Our aim to engage with the world at large*

## Strategic Objectives

- Promote ECpE as a globally recognized resource and leader in related education and research areas
- Increase engagement with industry, academia, alumni, and the public, both nationally and internationally

## Key Actions

- We will increase our efforts to educate K-12 students, teachers, and community college instructors about the important roles of electrical, computer, software, and cyber security engineering disciplines.
- We will encourage faculty to participate in developing new outreach programs and expanding existing programs.
- We will facilitate faculty presentations to the community, industry, and education groups around the world to showcase our programs.
- We will develop a regular communications channel that focuses on the needs of our students, alumni, industry partners, and other community members.
- We will continue to promote and recognize outstanding student, staff, faculty, and alumni achievements.





## Resources

*Our vision to support education and research enterprise*

## Strategic Objectives

- Obtain resources for the department, commensurate with the need to meet 21st century challenges
- Develop and operate under a sustainable revenue model that is independent of student enrollment and counter-cyclical to the general economy

## Key Actions

- We will launch awareness campaigns to advocate for a new building to improve and transform the learning and working environment.
- We will seek sustained internal and external funds to develop new curricula and upgrade teaching labs.
- We will routinely upgrade existing computing, networking, and storage infrastructure and major lab equipment.
- We will develop interactive and collaborative learning environments by modernizing existing facilities and adding new spaces.
- We will increase participation in professional development opportunities for students, staff, and faculty.