RIDE: Reinventing the Instructional and Departmental Enterprise to Advance the Professional Formation of Electrical and Computer Engineers

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This material is based upon work supported by the National Science Foundation under grant number EEC-1623125. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.
ECpE at ISU at a Glance

- 380+ graduate students
  - 180+ PhD, 200+ MS (PhD in EE, CpE, MS and MEng in EE, CpE, InfAs)
  - 2000+ undergraduate students (across 3 majors: EE, CpE, SE)
- 50 faculty, $14.0M+ annual research expenditures
- 20 NSF CAREER award winners
- 19 IEEE Fellows, 3 APS Fellows, 2 ASEE Fellows

- Strategic research areas: (1) energy and power systems, (2) materials and devices, (3) cybersecurity and networking, (4) bioengineering, (5) communications and controls
RIDE Project

• In the face of resistance to change, an innovative approach to redesign core ECE curriculum that involves buy-in from the department administration, faculty, and students

• Course redesigns using X-teams and design thinking

• Discussion of progress and ideas using Y-circles
RIDE: X-Teams

A new academic structure based on a cross-functional, collaborative instructional model for course design and professional formation pedagogy (PFP).
RIDE: Y-Circles

A community of practice in the department that engages in a process of discovery and inquiry (“why”) to bridge the engineering education research-to-practice gap and thus increase the use of evidence-based teaching.

- Promote design thinking, systems thinking, professional skills such as leadership, and inclusion;
- Contextualize course concepts; and
- Stimulate creative, socio-technical-minded development of ECE technologies for future smart systems, including security and privacy.
RIDE Vision

- Collaborative department structures and innovative, inclusive practices for teaching and learning
- Advances in scholarly teaching and education research department-wide
- ECE student professional formation and inclusion in the middle years with an emphasis on design thinking, responsible development, and professional engineering identity
- An agile department able to respond to industry and society needs, sustain innovations, and serve as a model for ECE, computing and engineering departments