

# IOWA STATE UNIVERSITY

Department of Electrical and Computer Engineering

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



ECE leadership team (Khokhar, Jacobson, Jones, Mina, Rajala, Rover, Zambreno), with collaborators in Design (Yilmaz), Education (Burt, Rodriguez), Engineering (Constant), Social Sciences (Larson, Shelley), WiSE (Chrystal), and RISE/Evaluation (Kemis)



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# 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



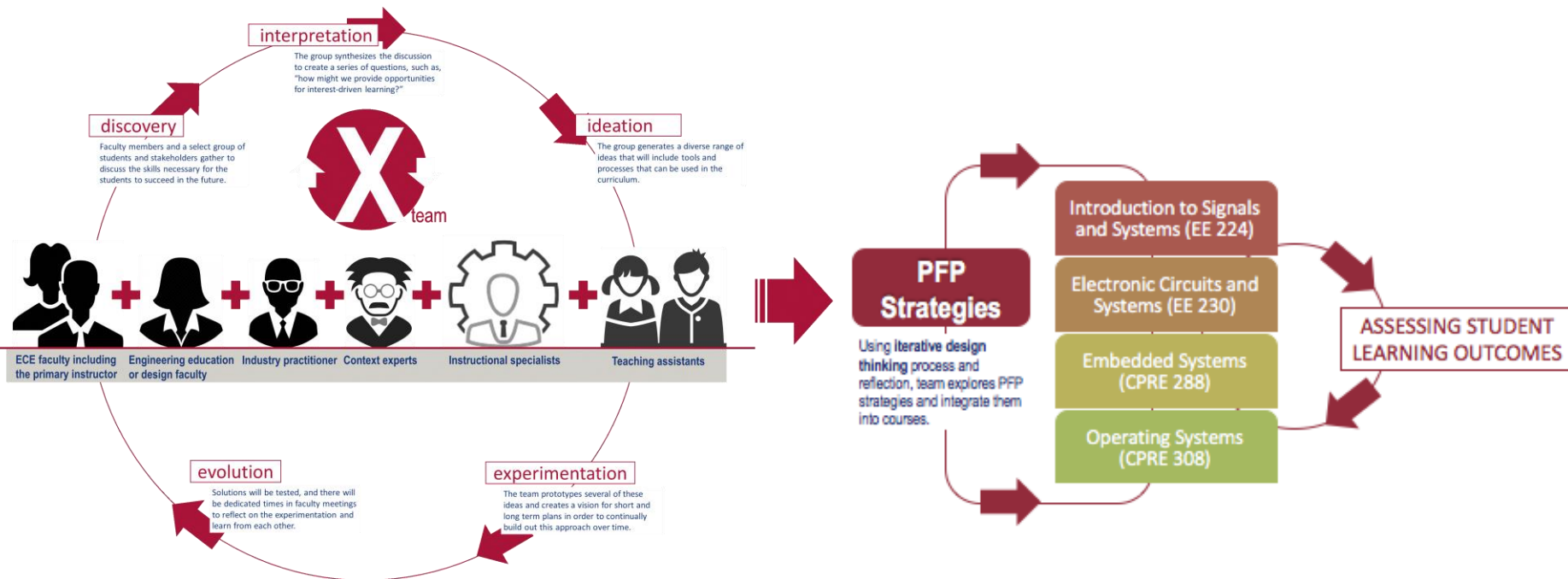
- In the face of resistance to change, an innovative approach to redesign core ECE curriculum that involves buy-in from the department administration, faculty, and students
- Course redesigns using X-teams and design thinking
- Discussion of progress and ideas using Y-circles



# RIDE: X-Teams



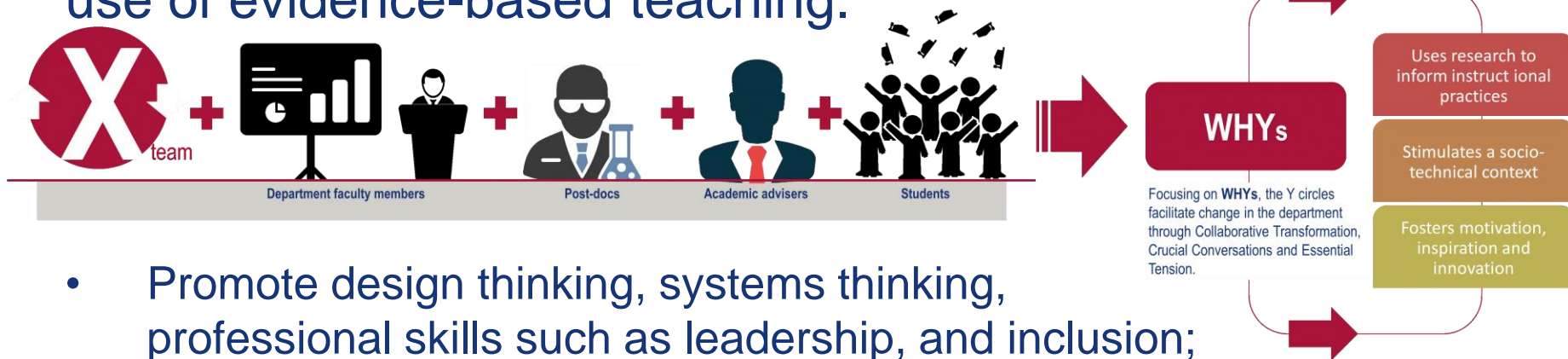
A new academic structure based on a cross-functional, collaborative instructional model for course design and professional formation pedagogy (PFP).



# 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