



IOWA STATE UNIVERSITY

IUSE/PFE:RED: Reinventing the Instructional and Departmental Enterprise (RIDE) to Advance the Professional Formation of Electrical and Computer Engineers

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REVOLUTIONIZED STUDENT

Design Thinker

Systems Thinker

Leader

INDUSTRY

INNOVATION

Agile

Collaborative

Inclusive

REVOLUTIONIZED DEPARTMENT

the 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 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 across the country.

the RIDE goals:

Reshape core technical ECE curricula through pedagogical approaches that (a) promote design thinking, systems thinking, professional skills such as leadership, and inclusion; (b) contextualize course concepts; and (c) stimulate creative, socio-technical-minded development of ECE technologies for future smart systems. (Professional Formation Pedagogy)

Develop X-teams, a revolutionary cross-functional, collaborative instructional model for course design and professional formation.

Support an iterative design thinking process for X-teams to enhance their understanding and integration of RIDE PFP strategies.

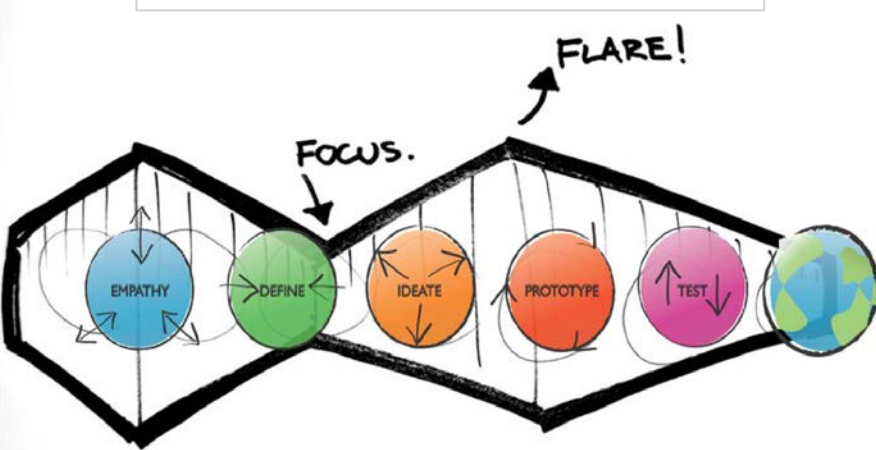
Implement a transformation process for the department through Y-circles, bridge the engineering education research-to-practice gap, and build an organizational culture that fosters and sustains innovation.

Advance engineering education research as a domain in the department, college and university.

Collaborate with national networks and major partners for dissemination and adaptation.

Professional Formation Pedagogy

Design Thinking



Research-to-Practice

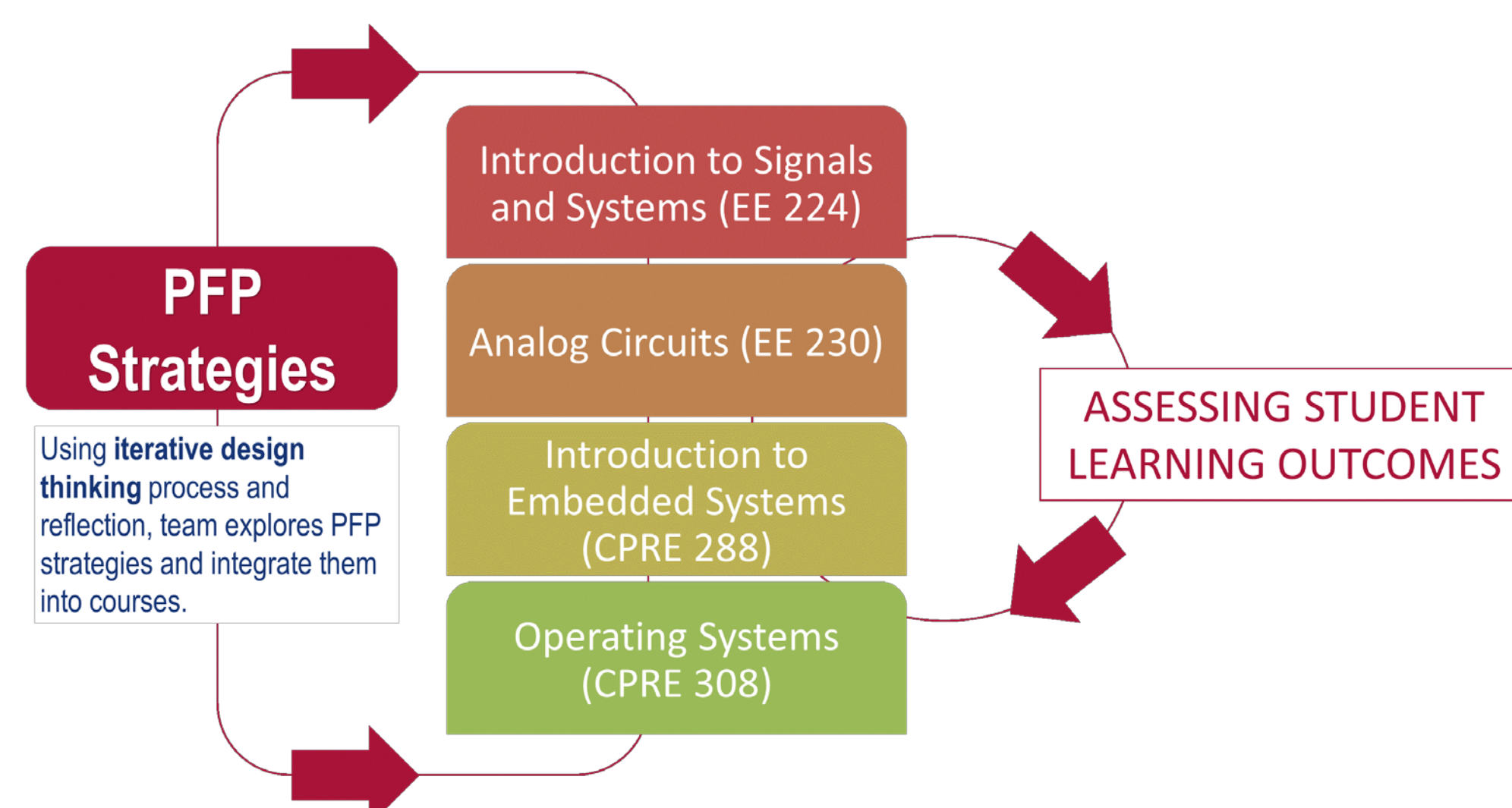
Agile Department

BE > YOU
IMAGINED

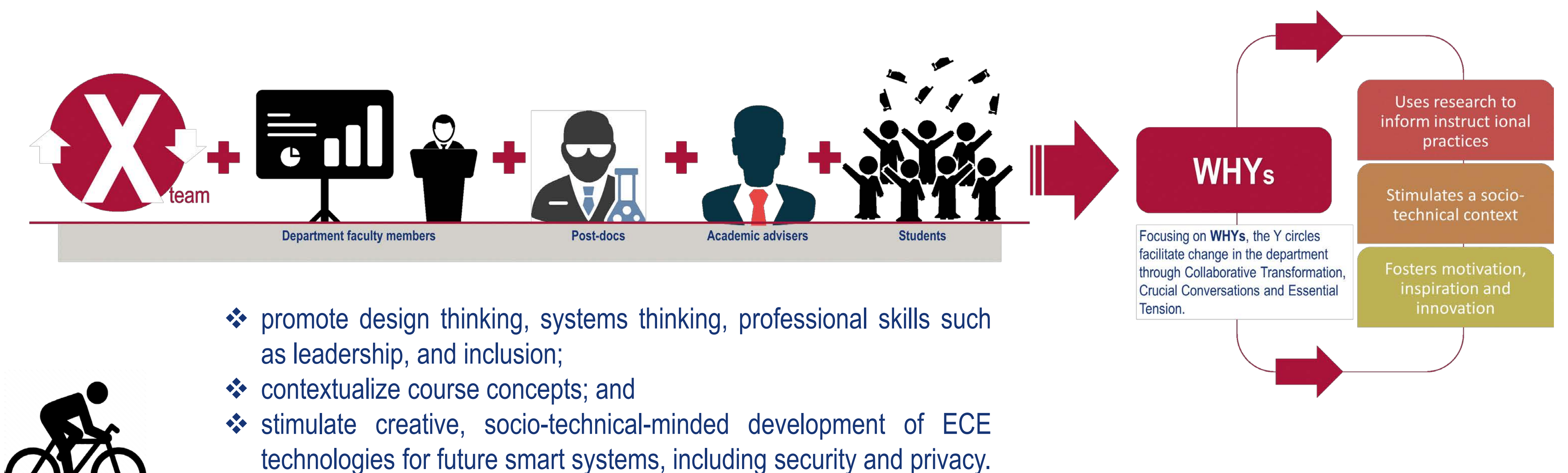
Student and Faculty Development

Shared Leadership

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



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.



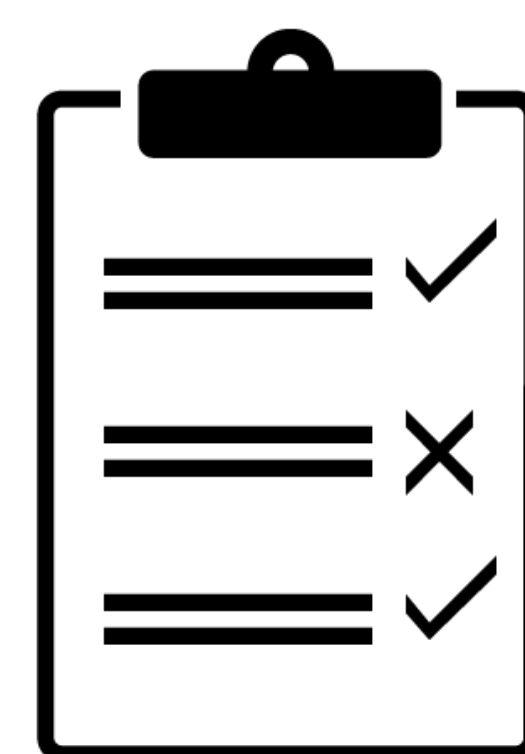
Research

Instructional Heuristics: What are the characteristics of heuristics that are successful in creating new teaching approaches and assessing student performance?

Student Development and Persistence: In what ways, do emerging identities shape (and reshape) individual perceptions towards ECE? What instructional interventions focused on design thinking are most influential in the development of a professional ECE identity?

Faculty Motivation: Does participating in Y-circle and X-team processes result in more faculty satisfaction and engagement based on Self Determination Theory needs?

Evaluation



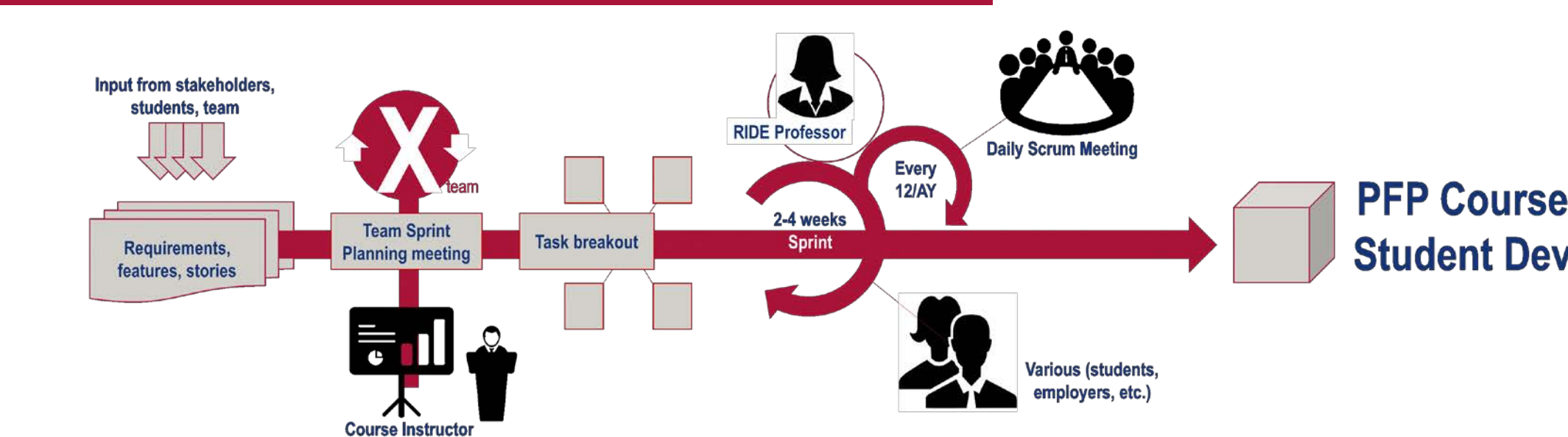
Establishing trends in attracting and retaining diverse students.

Understanding changes in practices and attitudes about professional formation and learning for both faculty and students.

Studying changes in department structures, policies and procedures.

Evaluating new pedagogical models and teaching practices.

Project Management



SCRUM agile process as culture change agent.

Product	Product Owner	Scrum Master/Coach	Team Members	Stakeholders	Sprint Period	Number Sprints/Yr
PFP Course, Student Dev	Course Instructor	RIDE Professor	X-Team	Various (students, employers, etc.)	2-4 weeks	Approx. 12/Yr
Faculty Dev, Dept Struc	Dept Chair	RIDE Professor	DEP/CT/CC facilitators, X-team leaders	Y-Circle, advisory boards, institution, NSF, etc.	8-10 weeks	3-4/Yr
Project Outputs, Outcomes	RIDE Director	RIDE Professor	Project team, Working groups	Department, boards, partners, NSF, etc.	6-8 weeks	Approx. 6/Yr

Partnering and Networking

