2020-21 Strategic Instructional Innovations Program
The Grainger College of Engineering at the University of Illinois at Urbana-Champaign

Competitively awarded grants enable faculty teams to accelerate best practices for teaching, develop new best practices, and reimagine what it means to educate our students.

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Remote testing with PrairieLearn
This team is adding new functionality to PrairieLearn to better support remote learning (instructor and student support, security, provision of resources), to scale to more courses, and to support large course staff and instructor communities.
Tim Bret (AE), Geoffrey Herman (CS), Craig Zilles (CS), Mariana Silva (CS), Dave Mussulman (Eng IT), Matt West (MechSE)

Revising the CS Introductory Programming Sequence
This team will propose curricular changes, including the addition of two newly restructured courses, to improve the CS introductory programming sequence.
Geoffrey Challen (CS), G. Carl Evans (CS), Margaret Fleck (CS), Michael Nowak (CS), Michael Woodley (CS), Craig Zilles (CS)

Cross-Engineering Course Assessment Model for Engineering Mechanics Courses
This team aims to improve engineering student learning experience and academic performance by developing tools that foster continuity between engineering courses in the engineering mechanics series.
Wayne Chang (MechSE), Randy Ewoldt (MechSE), Brian Mercer (MechSE)

Excellence in Computer Engineering Education (EXCEED): Incorporating Parallel Programming Thinking in ECE Curriculum
This team is developing and piloting learning modules on parallel and distributed computing in key courses across ECE.
Yuting Chen (ECE), Zuofu Cheng (ECE), Kirill Levchenko (ECE), Ujjal Bhowmik (ECE)

Improving Undergraduate Writing Instruction and Feedback through Professional Development of STEM Graduate-Student Teaching Assistants
This team will develop a graduate-level course to introduce pedagogical tools for teaching writing in STEM and to assist graduate students in understanding STEM writing and improving as writers themselves. The team will also assess the impacts of the course.
S. Lance Cooper (Phys), Celia Elliott (Phys), John Gallagher (English), Blake Johnson (MechSE), John Popovics CEE, Paul Prior (English), Julie Zilles (Crop Sciences)

Interdisciplinary Methods for Research Computing: A Course for New Researchers
This team will create a pilot course covering computational research skills for researchers across many disciplines.
Neal Davis (CS), Jake Bowers (PS/Statistics), André Schlieje (MatSE), Rich Sowers (ISE), Elizabeth Wickes (Information Sciences)

Early Instruction in Linear Algebra and Computational Tools in the Curricula of CS, MechSE, and the College of Engineering
This team will redesign instruction in concepts of linear algebra and linear structures, in order to provide undergraduates in MechSE, CS, and other departments with substantive, practical knowledge in these essential fields early in the curriculum.
Sascha Hilgenfeldt (MechSE), Philipp Hieronymi (Mathematics), Luke Olson (CS), Mariana Silva (CS), Matthew West (MechSE)

Learning by Immersion: Creating Virtual Reality Labs for Electromagnetism Courses
This team will support students who struggle with their understanding of electromagnetism theory by developing 3D visualizations of abstract physics in an immersive, exploratory, and engaging environment.
Raluca Ilie (ECE), Eric Shaffer (CS), Erhan Kudeki (ECE), Cynthia D’Angelo (Educational Psychology)

PrairieLearn and Course Redesign for Core CEE Intro Sequence
This team will integrate the PrairieLearn platform in two core CEE courses– facilitating new approaches in content and in best pedagogical practices.
Sotiria Koloutsou-Vakakis (CEE), Hadi Meidani (CEE), Eleftheria Kontou (CEE), Lei Zhao (CEE), Chris Tessum (CEE)

Peer Mentorship via Undergraduate Learning Assistants in PHYS100 Discussion Sections
This team will introduce undergraduate learning assistants as a core component of the Physics 100 student experience and will assess the impact of this addition on student learning, sense of social belonging, and motivation.
Eric Kuo (Phys), Gary Gladding (Phys), Morten Lundsgaard (Phys)
ENgaGement In eNgineering Education (or ENGINE)
This interdisciplinary team is exploring non-traditional teaching methods and learning assignments, such as playful and community-building techniques, for developing student motivation and professional mindsets.
Leon Liebenberg (MechSE), Cheelan Bo-Linn (CITL), Justin Aronoff (Speech & Hearing Sci), Robert Baird (CITL), Tim Hale (Kinesiology & Community Health), Katherine LaBare (Library), H. Chad Lane (Educational Psych), Brian Mercer (MechSE), Alex Pagano (MechSE), Shelly J. Schmidt (FSHN), Saad Shehab (ScD), Ava Wolf (CITL), Taylor Tucker

Understanding the Needs and Learning Pathways of Students with Disabilities
This team will identify potential course improvement opportunities to help students with disabilities. Inspired by the Universal Design for Learning they will seek to understand how students interact with course components and how they perceive the value of multiple representations of course materials and multiple ways of communications.
Hongye Liu (CS), Jenny Amos (BioE), Lawrence Angrave (CS)

Facilitating Adoption of Collaborative Activities using Computer-Based Tools
This team will develop and improve existing computer-based tools to facilitate collaborative and active learning work inside and outside of the classroom.
Mariana Silva (CS), Abdussalam Alawini (CS), Mattox Beckman (CS), David Mussulman (EngIT), Jenny Amos (BioE), Geoffrey Herman (CS), Karin Jensen (BioE), Eric Shaffer (CS), Andre Schleife (MatSE)

Developing Intervention Methods that Improve Visuospatial Skills of Engineering Students
This team is developing computerized training modules to enhance students’ visuospatial skills to be implemented in three large engineering design courses.
Brian Woodard (AE), Gretchen Forman (GFX), Molly Goldstein (ISE), Julia Laystrom-Woodard (AE), Tiffany Li (CS), Michael Philpott (MechSE), Angie Wolters (WIE), Ziang Xiao (CS)

Improving the Writing Skills of Undergraduate Engineering Students: Empowering Engineering Faculty and Teaching Assistants*
This team has built interdisciplinary faculty learning communities around writing in engineering, integrating writing instruction and practice within existing technical courses across all four undergraduate years, assessing the effectiveness of the vertical integration, and advancing understanding of effective development of engineering students’ writing skills.
John Popovics (CEE), John Gallagher (English), Bruce Kovanen (English), Megan Mericle (English), Paul Prior (English), Nicole Turnipseed (English), Ryan Ware (English), S. Lance Cooper (Phys), Celia Elliott (Phys), Julie Zilles (Crop Sciences), Patrick Coleman (Phys)

iELITE TA Training SIIP Final Report*
This team continues to teach a course to prepare graduate students in Grainger Engineering for their instructional and leadership responsibilities.
Mattox Beckman (CS), Yuting Chen (ECE), Blake Johnson (MechSE)

*Teams in SIIP community after completing standard funding.