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BIOMEDICAL ENGINEERING
Carnegie Mellon University

Active Learning as an Engineering Design Problem

PRESENTED BY

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SCHEDULE

Doherty Hall (DH) 2315

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(11:00 AM - 12:00 PM)

Active learning is now widely recognized as an effective approach for improving student engagement and learning in engineering education. Yet translating this evidence into classroom practice often proves more challenging than the literature suggests. Instructors frequently encounter tensions between pedagogical ideals and the realities of large enrollments, content-heavy curricula, and institutional expectations.

In this talk, I frame the implementation of active learning as an engineering design problem. Drawing on prior research and years of practical experience implementing and discussing active learning strategies in engineering classrooms, I examine how instructional choices interact with constraints such as course structure, assessment systems, student expectations, and classroom environments. Particular attention is given to the role of transparency and communication with students, an often overlooked design element that strongly influences how new instructional approaches are received and sustained.

Using examples from foundational engineering courses such as Biomechanics, the talk explores common design tradeoffs, implementation challenges, and the importance of iterative refinement when introducing active learning into traditionally lecture-based environments. By viewing classroom instruction through the lens of design, one that must account for constraints, stakeholders, and evaluation metrics, this perspective helps explain why similar instructional approaches can produce different outcomes across contexts.

Dr. LeAnn Dourte is a Practice Associate Professor of Bioengineering at the University of Pennsylvania, where she also serves as Undergraduate Curriculum Chair and ABET Faculty Director. Her work focuses on evidence-based teaching practices in engineering education, particularly the design and implementation of structured active learning environments. She has led and studied the transformation of traditional engineering courses into active, hands-on learning experiences, integrating group problem solving, physical demonstrations, and peer learning to deepen conceptual understanding.