



DISTINGUISHED ENGINEERING EDUCATORS SERIES

CENTER FOR EXCELLENCE IN LEARNING AND TEACHING

SUNDAY, MARCH 20, ROOM 2-136, 12.00 – 13.00

Format: Workshop

Title: *Sketching to Improve Design*

Abstract: Every engineer appreciates the value of a sketch to describe a physical object to a colleague or to record ideas when developing design options. However, most of today's engineering students prefer the use of CAD programs over pencil and paper sketching. Many have never been trained in drawing skills and are reluctant to try to draw by hand. These students are not aware of the value of sketching to

improve creativity and bring other benefits to the design process. What happens physically during sketching is easy to see and understand. However, the mental (or cognitive) activities during sketching are impossible to observe in real time and challenging to record in any fashion. The cognitive processes involved in sketching have been explored by many researchers in various concentration areas, including: engineering,

architecture, art, education, and psychology. Research done at the University of Maryland demonstrates that students can be easily influenced to improve the content of their sketches regardless of their drawing skills. The capstone design course in Mechanical Engineering at Maryland has incorporated increased use of sketching with positive results. These developments will be presented during this workshop.

MONDAY, MARCH 21, ROOM 8-024, 12.00 – 13.00

Format: Workshop

Title: *Enhancing and Assessing Teamwork*

Abstract: The project team has become a well established primary learning environment for engineering students. ABET accreditation reflects this in their required student learning outcome: the ability to function on multidisciplinary teams. However, the field of engineering education appears to have an ambivalent attitude toward this pedagogical approach. Many students and faculty dread team projects for reasons that include: team conflicts, including how to handle "slackers," logistical

problems, and how to evaluate the work of individuals when the team grade is based on a completed project. This workshop will discuss and share team operation guidelines; establishing effective peer evaluation regimes; and assessing individual learning objectives. Many of these strategies were developed by during research done under a National Science Foundation funded project called BESTEAMS (Building Engineering Student Team Effectiveness and Management Systems (1996 -2005)). BESTEAMS conducted scholarly research

to model the engineering student-project team environment and develop curriculum enhancing standardized team skills training modules for delivery by engineering educators. Under the grant, BESTEAMS strategies were used to train over 4000 engineering students at a variety of courses and institutions. The workshop will present the strategies for enhancing team performance and introduce the BESTEAMS training process.

TUESDAY, MARCH 22, ROOM 2-136, 12.00 – 13.00

Format: Workshop

Title: *Designing Great Design Projects for Engineering Students*

Abstract: Given the distinctive demands of engineering project teams in a university context, the emphasis of any project must be on student learning rather than efficiency or, perhaps, even overall product quality. Engineering educators should not be satisfied unless all students gain proficiency in all aspects of the subject matter addressed by a particular

project. It is possible to design to select design projects and design a course plan that will guide all students through an engineering design course with a minimum of unproductive time. To do so, instructors must scope the project topics thoughtfully to align with course learning outcomes and student capabilities. It is difficult to balance some students'

desire to "build something" with the educational goal of "designing something" before building. Intentional crafting of an engineering design course, including the selection and scoping of project, will benefit faculty and students alike. These will be the main focus of this workshop.

Presenter:



Dr. Linda Schmidt
University of Maryland

Dr. Schmidt is active in engineering design theory research and teaching engineering design to third- and fourth-year undergraduates and graduate students in mechanical engineering. Schmidt is the co-author with George Dieter of the text "Engineering Design, 4th edition", published by McGraw Hill in 2008. A 5th edition is due out in early 2012. She has also co-authored a text on engineering decision-making, two editions of a text on product development and a team-training curriculum for faculty using engineering student project teams.

Dr. Schmidt has published over seventy refereed publications in the areas of mechanical design theory and methodology, issues and applications in generative design, and studies of effective student learning on engineering project design teams. Four of the referred conference papers were cited for excellence, two on design theory and two on student design team research. Schmidt received a National Science Foundation Faculty Early Career Award for research on theory and methods for generating designs with grammars. Dr. Schmidt was awarded the American Society of Engineering Education's prestigious Fred Merryfield Design Award for 2008.