



Engineering and Science Education Seminar  
Friday, October 3, 2008, 3:30 – 4:30 pm  
422 Rhodes Engineering Research Center

## **Investigations of Model-based Reasoning in Engineering Practice and for Learning**

**Dr. Wendy Newstetter**  
Georgia Tech

This presentation focuses on the opportunities and challenges associated with investigating model-based reasoning (MBR) and problem solving in engineering practice and education. The first part of the talk will address our reasons for investigating if, how and where students learn to develop models and use them in problem solving. The rest of the talk will focus on three studies we have or are conducting, the methods and modes of analysis used and the lessons we have learned from conducting these studies. The first study was a six-year investigation of reasoning and learning in interdisciplines. The second is a comparative study of problem-driven versus technique driven designs for instructional laboratories. And the third is an investigation of the development of model-based reasoning in problem-based learning classrooms. This will offer a window onto the process of designing and executing different kinds of studies on cognition and learning in engineering practice and learning.

### **Presenter Biography**

Wendy C. Newstetter is the Director of Learning Sciences Research in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech. Dr. Newstetter's research focuses on understanding cognition and learning in interdisciplines with an eye towards designing educational environments that support the development of integrative problem solving. Her ethnographic investigations of three interdisciplinary research laboratories have informed the design of problem-driven learning (PDL) classrooms at Georgia Tech designed to foster integrative model-based reasoning. With support from the Spencer Foundation, she has investigated the experiences of under-represented minorities in university research settings to better understand how gender and race are enacted at the bench top. She is also working with statics professor at Georgia Tech to design web-based learning supports that aim to make engineering attractive to women and minorities. She works with faculty both at Georgia Tech and throughout the nation through Project Kaleidoscope to create and develop more effective science, math and engineering educational environments informed by learning and cognitive science research. Dr. Newstetter has published in numerous journals and conference proceedings, including the Journal of Engineering Education, Research in Engineering Design and the Annals of Biomedical Engineering. She is an Associate Editor for the Journal of Engineering Education.

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