

## Teaching Multidisciplinary Design Optimization (MDO) in a Reconfigurable Interactive Classroom

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Technology has so rapidly advanced in recent years that our present cadre of students has grown up using various personal communication devices, laptop computers, and tablets. Their expectation on content delivery within the classroom does not conform to the traditional approach of lecturing at a board. The students have access to an array of devices – in class – that provides to them instantaneous access to information, methods, and tools. Not only are the students more technological and computer literate, but the rapid computational advances have also resulted in a variety of applications being available that previously were not. The availability of new tools, as well as new hardware and networking capabilities, provides us with the ability to teach our students in new and exciting ways.

In the Iowa State University's Aerospace Engineering Department, a new classroom has been conceived, which is referred to internally as the "next generation interactive classroom." The classroom was originally conceived by Dr. Richard Wlezian, professor and chair of the aerospace engineering department and former NASA and DARPA program director. The open-air classroom is designed to enable interactive breakout groups, using rolling chairs, glass topped whiteboards, and twelve video monitors lining both sides of the space. As many as 120 students have the ability to work in teams, easily reconfiguring the classroom in moments, with each team using individual monitors.



The new course, AerE 463X/563X: Introduction to Multidisciplinary Design Optimization (MDO), being taught by Dr. Christina L. Bloebaum and Dr. Bryan

Mesmer, has been designed specifically with the new interactive learning classroom in mind. MDO is, by its nature, an endeavor requiring team interaction. In this paper, we will address the opportunities available to incorporate state of the art technology, as well as facilities, into the teaching of MDO. We will demonstrate how the rapid redeployment of students, together with the access to internet, computers, tablets, personal communication devices, and group learning environments, can significantly enhance the student experience, and also better prepare them for being MDO advocates in the future.