Teaching Integrated Product and Process Design

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This paper presents a capstone senior design class that was designed for Manufacturing Engineering students at Texas State University-San Marcos with funding from the Society of Manufacturing Engineers - Educations Foundation. The course is unique in that students experience most all aspects of the design/development cycle to include product design, prototyping/verification, manufacturability analysis, and the design of manufacturing systems for the mass production of the product. A team based approach is used wherein some members of the team play the role of "design engineers" and some play the role of "manufacturing engineers." Student teams are also required to develop cost estimates and plan for the raw material required for production. Project management tools are used to plan the activities for the semester as well as to provide updates to the class on conformance of the project to initially established timelines. Finally, students make formal oral presentations to their peers and a cross section of faculty and industry guests. Based on the reactions of the faculty and students during final project presentations the following were evident: 1. the interest level was very high with student teams displaying product drawings/models, process plans, cost estimates and prototypes and 2. student teams were involved in all aspects of the product development cycle. Detailed evaluations of the course has been scheduled for Fall 2004.