

Lessons Learned in the Inaugural Capstone Design Course at Smith College

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Established in 2000, the Picker Engineering Program at Smith College is the first engineering program at an all-women's institution in the United States and one of few engineering programs nationally in a liberal arts college. In addition to emphasizing technical competence, the program also focuses on using a learner-centered approach to teaching engineering within a liberal arts setting. Engineering students at Smith receive a broad-based engineering education and graduate with a B.S. in Engineering Science.

The Engineering Design Clinic, EGR 410, serves as the required capstone design experience for engineering seniors and was first offered for the inaugural class of engineering majors in AY 2003-2004. Modeled partially after the longstanding program at Harvey Mudd College, the Design Clinic is a year-long course in which teams of four students work on real-world engineering design problems sponsored by industry and government. In conjunction with their ongoing design projects, students attend a weekly three-hour seminar. While some of the seminar sessions are reserved for team presentations, the majority are devoted to topics related to engineering design and professional practice, and are intended to aid students during the design process and introduce them to topics they may encounter in their professional careers.

While aspects of the Design Clinic mirror those of other established capstone courses across the country, thus contributing to the success of the inaugural offering of the course, feedback from students and experiences of the instructor suggest that the course would benefit from some specific, targeted modifications. Some components of the course met the overall course goal of providing an integrated, learner-centered, design experience for the students, but others did not. Moreover, some of the components were successful in isolation, but were not effectively connected to create a cohesive course rather than a series of seemingly unrelated lessons.

This paper highlights lessons learned in the first year of the Design Clinic, based on student outcomes, student feedback, focus group results, and instructor observations. In particular, the paper discusses the successful and not-so-successful aspects of the course, including project selection, liaison selection, team formation, team presentations and deliverables, course structure, seminar content, incorporation of guest speakers, and assessment methods. The paper also documents proposed changes to the course in subsequent offerings, to improve student learning. While the results in this paper are derived from experiences at Smith, they are applicable to a wide range of institutions; as such, they are presented as a potential resource for instructors seeking either to start a capstone design program or revamp an existing one.