

Challenges of Revamping the Freshman Experience

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In our School of Engineering, the freshman sequence is in flux. It is changing more than the average changes expected as a curriculum evolves. Several years ago, a group of faculty felt that there was a change needed in the freshman year experienced by our incoming students. At that time, all students were required to take the EGR101 course, which was a class on graphical communication, CAD/CAM, and basic manufacturing. The next course taken by all engineering students at the end of the first year, was EGR261, which was a class on C Programming. Both classes are heavy in homework and teach students very valuable skills; however, electrical and computer engineering students tended to dislike and devalue the EGR101 course. The mechanical engineering and the product design and engineering students tended to devalue EGR261, the C Programming Course.

There was a clear motivation to improve the experience of the freshman students; however, these classes have learning objectives that cannot be ignored. A class cannot be added, so it was decided to create a two course sequence, which would replace the existing courses, but with the two topics being taught together as valuable tools to be learned by all engineers and not a class taught with only one discipline in mind.

The new courses, EGR106 and EGR107, are taught as a sequence. That sequence has inherited the learning objectives of the previous two courses, which are not normally taught together. CAD/CAM and C programming courses seem like an odd combination to have in a class together, and posed a challenge to integrate. At first the topics were taught side-by-side with little integration beyond a project that required the students to build robots and program them.

The new courses continue to be in flux today as more methods of integrating the topics are explored. One such method, is to use Arduino as a platform to introduce the students to programming, while allowing students to explore other aspects of electrical engineering. At the same time, Arduino can be programmed to control the robots built at the end of the semester. In addition, design process topics traditionally taught in the EGR101 course is being expanded to include programming, and electronic devices.

There were two complete courses being taught before, and they cannot be replaced and added to without affecting outcomes. The hope is always to improve outcomes, but it is a challenge to integrate the students, and introduce them to electrical engineering (missing from the original courses) without making room by reducing time spent on other topics in the course.

This presentation will focus on the challenges faced as we strike the balance between introducing the students to various aspects of the different engineering disciplines and fulfilling the learning objectives inherited and required by the courses that follow in the sophomore year.