

Building Community Relationships with a Senior Design Experience

Profs. Scott Kiefer, Kala Meah, James Moscola, and Tristan Ericson
Department of Engineering and Computer Science
York College of Pennsylvania
York, PA 17403

The Mechanical, Electrical, and Computer Engineering Programs at York College have mandatory co-op programs in which each student receives three semesters of engineering work experience. Our senior design courses further develop our students' design and project development skills by intentionally targeting projects that emphasize working within a larger team. For example, we have built autonomous robots for the International Ground Vehicle Competition (IGVC) and formula style race cars for the Society of Automotive Engineering Formula Student Design Competition (FSAE). While successfully developing our students' project development and group communication skills, these projects lacked the personal interaction with a customer with well (or sometimes poorly) defined specifications and constraints. To fill this need, and to help build community relationships, one of this past year's senior design projects sought to design and build a bike rental system. The product will connect the college campus to the downtown York business district. Two representatives from companies in the business district were the customers who helped the students develop specifications, participated in planning meetings, and attended design reviews of the bike rental system. We and our business partners hope that the bike rental system will increase the number of students frequenting downtown York and its businesses.

In the first stage of this project, in the 2014-15 academic year, two teams of engineering students developed their own independent designs. Each team had about ten mechanical, electrical, and computer engineering students. Faculty advisors from all three disciplines advised on the projects. The initial phase of the project was conducted over two semesters. The design work was completed in the first semester (summer 2014), and the construction and testing of two prototypes was completed in the second semester (spring 2015). After prototype completion, both designs were presented to the company representatives to solicit their feedback. This concluded the first phase of the project.

After receiving feedback from the customers, the second phase of the project, spanning the 2015-16 academic year began with a new group of students. These students further developed the mechanical, electrical, and computer designs this past summer (2015), combining the best aspects of the two prototype designs. These students will construct two bike racks (spring 2016) for implementation. We intend to place one bike rack on campus and the other in downtown York when they are complete.