

Students used computer-aided design (CAD) models to help plan their projects. This team came up with an attachment for walkers that would improve users' ability to traverse uneven terrain.



<Students show off the inner workings of their portable device that helps the disabled when moving into or out of a sitting position. The device (which would be cushioned) helps transfer the user's weight to ease knee strain.

The centralized handle on this pitcher reduces stress on the wrist when pouring liquid from large containers. This product will aid customers with carpal disabilities such as arthritis.



STUDENTS DESIGN PRODUCTS THAT HELP THE ELDERLY AND DISABLED

Every year, seniors majoring in Mechanical Engineering participate in the Senior Capstone Design Course — it's *the* course that puts an exclamation point at the end of a four-year rigorous education.

The senior design course requires students to research and develop a useful product during the span of a single semester. The process is multiphased, starting with research of a specific market demand. The class of 2006 focused on the necessities of the disabled and elderly. "We take pride in our community outreach efforts, which allow our students to identify real-world needs through a type of anthropological study," said Assistant Professor Jeremy Michalek, who facilitated observation of senior citizens in assisted living environments. Working in teams of three or four, the students identified where innovation was needed and came up with possible solutions.

The teams created several prototypes to explore their design ideas. They analyzed each design's success and used their analysis to refine a product's design. The final products included a modular-angled hand railing to help people climb stairs, seats that move

disabled people in or out of a sitting position, and walker attachments that permit users more freedom of movement. One team designed a plastic strip that fits inside the lip of a cup to allow for spill-free drinking.

"The purpose of this course was to use all of our theoretical knowledge that we had learned in the previous three years and create something concrete that could be useful, marketable, and even patentable," said Sara Rockwell, who is pictured with the product she helped design — a pitcher with a centralized handle that reduces stress on the wrists of users with carpal disabilities, such as arthritis.

In this course, as in the real world, usability and presentation are just as important as traditional design and analysis, concepts with which engineering students are more familiar. Exposure to in-depth concept development is rare for engineering students and this is what makes a mechanical engineering degree from Carnegie Mellon so valued.

>This team solved the problems of current handrails by coming up with a more ergonomic design. The disabled will be able to climb stairs more easily when they put their weight on these angled supports.



<Some teams designed products that could help not only the disabled population, but those without disabilities as well. This product fits inside the lip of a beverage container and was masterfully engineered to reduce spillage and sloshing.



By Amy Bickerton



This carousel-like shelving unit eliminates the need for bending or stretching by bringing goods within reach at the press of a button.

This cutting device will help customers who have lost the ability to grip and squeeze. It can be used for household tasks and yard work.



<This hands-free walker will give more freedom to handicapped users.

INNOVATION MANAGEMENT MASTER'S PROGRAM PROMISES NEW BREED OF ENGINEERS



Innovation can rocket a company to spectacular heights, and force the competition into the precarious position of playing catch up. Business leaders know that failure to exploit emerging technologies and lack of creative thinking can lead to flat growth. They also know that to spur on technological innovation in their companies, they need to hire managers with substantial technical skills and business acumen, and these people are hard to find. It's exceedingly difficult to find people who can do this well in the global marketplace.

"Our vision is that the engineer of the future must be able to enable, create, manage, and deploy innovation in a multinational environment," says Dean Pradeep Khosla. This vision combined with industry's needs fueled Carnegie Mellon to launch a new master's program, the Engineering and Technology Innovation Management program, or E&TIM for short.

Eden Fisher, executive director of E&TIM, explains that engineers who enroll in the program will broaden their skills and learn the ins-and-outs of successful innovation management. "Because innovation management starts with a focus on value creation, engineering students in this program will view technical possibilities with new eyes," says Fisher.

Core courses highlighting business practice include managerial and engineering economics and the strategy and management of technological innovation. An engineering project course provides students the experience of designing a solution to a real customer need, and a seminar course provides engagement with industrial innovators and innovation managers. Students build their individual curricula by choosing from a variety of electives, including graduate engineering courses, to address their specific interests and professional needs. The one-year, full-time program runs from January to December and includes a hands-on internship during the summer that will give technological-savvy students an opportunity to flex their innovation management skills.

The E&TIM program is coordinated by CIT's Department of Engineering and Public Policy in collaboration with the Tepper School of Business, the H. John Heinz III School of Public Policy and Management, and the Department of Social and Decision Sciences in the College of Humanities and Social Sciences.

To learn more about the program, visit the E&TIM web site at www.cit.cmu.edu/etim. E&TIM also welcomes industrial supporters. To learn how your company could benefit by working with our students, contact Eden Fisher, email etim@andrew.cmu.edu.

Using the money they raised, the students went to local stores and bought toys for children of all ages.



The holidays were a lot merrier for local needy children thanks to the efforts of CIT students.

The students, all members of the College's First-year Advisory Board (FAB), gathered more than \$1,500 worth of toys and money for the U.S. Marine Corps' Toys for Tots program.

Each year the Marines give less-fortunate children new toys as a way of encouraging them to become responsible, patriotic citizens and community leaders. Mirroring that sentiment, CIT administrators, including student advisor Pam Golubski, believe that community service can provide meaningful educational opportunities for students. This proved true during the toy drive, when the students grasped how their volunteer work could impact Pittsburgh's children. CIT student and FAB president Joshua Bordin believes that his group's efforts made a difference for many local kids because the postal service did not permit the traditional collection of toys at area post offices this past holiday season.

A well-rounded education consists of learning experiences that are acquired

TAKING TIME TO HELP OTHERS



A team of Percheron horses, driven by Rod Pattison, Jr., pulled a sleigh-full of student volunteers across campus.

outside of the classroom as well as inside. Here in CIT, first-year students learn, along with engineering and calculus, that they have the capacity to affect others. And sometimes, that can lead to a lot of fun for everyone involved.

STUDENTS CREATE A PLAN THAT OUTLINES WI-FI OPTIONS

A group of Carnegie Mellon students and their professor Jon Peha, of EPP and ECE, presented to Pittsburgh's City Council in February a report that examines options for establishing wireless Internet service throughout the city.

The report, a culmination of a semester-long EPP project, aims to provide local officials with information on the factors associated with deploying and sustaining citywide Wi-Fi. The students analyzed technology needs and costs, along with possible revenues and benefits the city could derive.

Who would build and run the Wi-Fi network are major questions and the report puts forward business models addressing these matters. For example, should the Wi-Fi system be an entirely public, nonprofit or private enterprise or should public and private groups partner? Which configurations would work best for Pittsburgh?

Presently, downtown Pittsburgh has Wi-Fi, and this motivated Councilman Bill Peduto to invite community leaders to a meeting last July to discuss the possibilities of expanding the service throughout the entire city. Peha says, "As a group, we had more questions than answers. I figured that Carnegie Mellon could do some research that would help leaders in government, industry, and nonprofits make good decisions." He created a new course for Fall 2006, and 21 graduate and undergraduate students from CIT and the Department of Social and Decision Sciences enrolled. When the term ended, four of those students decided to continue working on the project.

In their 163-page report, the students did not make recommendations. "We presented some options, and discussed their advantages and challenges both qualitatively and quantitatively," says Peha. He can't predict what course the city will take, if any, but he says, "I believe this study can change the public debate about the possibility of citywide Wi-Fi in Pittsburgh."



OUR THOUGHTS WERE WITH THE CHAMPION

In mechanical engineering, students learn about horsepower and how to engineer parts so that devices, like engines, run. With thoughts of energy and horses literally in mind, several thoughtful MechE students decided to make an edible holiday-themed get-well card for the great Barbaro, the Kentucky Derby winner who shattered his hind leg in the Preakness Stakes, the second race in the Triple Crown. "There's a lot of horsepower behind the graceful movement of a thoroughbred racehorse, who may carry nearly 1,300 pounds of horse and rider at 40 miles an hour," said John Wiss, an adjunct professor in MechE.

The students fashioned sugar cubes, apples, and carrots onto a large horseshoe-shaped card, and sent their creation off to the University of Pennsylvania's George D. Widener Hospital for Large Animals in Kennett Square, Pa.

Sadly, after a number of surgeries and medical setbacks, the champion was euthanized on January 29, 2007.

