

Engineering students design products to benefit disabled people

By Brian Swartz
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ORONO — Physical therapists say the devices work. Engineers say they are structurally sound.

And Mechanical Engineering Technology seniors at the University of Maine know that they've helped disabled people get around a little better.

Each fall semester, MET seniors split into teams to work on projects for the Senior Design Competition, usually held the next April. Each competition has an annual theme: last year, designing human-powered amphibious vehicles; two years ago and again in 1994-95, designing products to enhance the quality of life for the disabled.

Herb Crosby, professor of MET, explained that MET seniors "pick a theme they work on for the whole year." Completed projects count 30 percent toward the final grade.

In fall 1992, seniors started developing five new products for disabled people. These included exercise equipment for the wheelchair-bound, a walker for a child who has only partial leg use, an exercise swing for a child with a learning disability, a wheelchair for a child wearing a Spica body cast, and a side "layer" for a person who has no leg or arm use.

In fall 1993, seniors began designing amphibious vehicles demonstrated on campus in late April 1994. In September 1994, the 33 MET seniors formed four teams to build new products for the disabled.

These include:

- "A canoe for a person born with no arms," Crosby said. Working with Levant resident Michael Noyes, who was born without arms, seniors are designing a foot-powered canoe that has a clutch-style drivetrain;

- A lightweight, portable wheelchair desk. Two teams are designing such a desk.



Two years ago, seniors enrolled in Mechanical Engineering Technology at the University of Maine designed products to help disabled people. MET senior Nicole Trudel (right) worked with a team that

designed a wheelchair for a child wearing a Spica body cast. Trudel's sister, Katie, volunteered to play the role of a child who would use the wheelchair. (Photo courtesy of Herb Crosby)

One senior, who uses a wheelchair, finds that "there's never an adequate desk in any classroom he goes into," Crosby said. Though there are wheelchair desks "on the market, they tend to be too heavy and too bulky," he noted;

- A freight carrier for a back-injured individual who cannot wear a laden knapsack. "Students typically haul everything around in a knapsack," Crosby said. "If you've got a back problem, you often can't (use a knapsack).

"We're designing a carrier to haul groceries or books" through standard climatic conditions, including snow," he said. "It must be ultralight. We're going for the lightest and sturdiest design."

The MET seniors researched and designed their projects last semester. The teams are obtaining materials to build their projects; actual construction will start soon, with testing to follow.

Among the local companies supporting the Senior Design Competition are:

- The Lane Supply Co., which supplies the lightweight aluminum incorporated into most designs;
- Old Town Canoe, which donates canoes and kevlar;
- The Downeast Medical Shoppe, which donates wheelchairs;
- The James River Corp., which supplies bearings, plywood, aluminum, and steel;
- Wickes Lumber and Young's Canvas Shop.

The students initially make cardboard mockups to test their designs. "We expect problems; the best way to find them is by a good test program," Crosby said.

As the devices emerge from construction, they are tested to ensure their functionality. The four teams will unveil their respective devices during the design competition on Saturday, April 29.

According to Crosby, several licensed engineers and physical therapists will examine the devices and rate them. Two years ago, first place went to the team that designed a wheelchair for a child in a Spica body cast.