



David L. Jaffe, MS, teaches ENGR110/210: Perspectives in Assistive Technology, a winter quarter course that explores the broad spectrum of issues surrounding the design, development, and use of technology that benefits people with disabilities. This three-unit course consists of twice-weekly one-hour lectures by notable professionals, clinicians, and individuals with disabilities, as well as student participation in a team-based project that addresses a need of an individual with a disability. Students brainstorm the problem, submit a design proposal, fabricate and test a prototype, and present their team's functional solution at the end of the course. Lectures are open to all students and community members.

**1 Assistive Technology (AT) sounds very broad. How do you define it?**  
I would define assistive technology to include not only the devices that allow people to overcome their limitations, but also the broader issues of providing these devices, namely research, design/development, policy concerns, education, outcomes measurement, etc.

**2 The course consists of lectures by medical professionals, scientists, lawyers, engineers, product designers, individuals with disabilities, and others. What led you to structure the class in this format?**

When I worked as a research engineer for the Palo Alto VA for many years, I was exposed to a diverse team of people including engineers, therapists, and physicians who all worked to improve the health and independence of people with disabilities. I wanted students to be exposed to this broader realm of disability, rehabilitation, and assistive technology. While I didn't have the expertise across all areas, I knew people who did, so it was natural to invite them to be a part of the course. I present the initial lecture, an introduction to AT, and let my colleagues take it from there.

This format does not have the same kind of flow that comes from teaching sequentially from a textbook; rather, it is a series of diverse topics. In one class, I might have a researcher talk about her work, and then invite a person with a disability to speak about his life experiences in the next class. I find this interesting, and so do the students. This year, the class was given a tour of the VA's spinal cord injury unit, which took students out of the classroom and into a clinic where the rehabilitation work actually happens. They were able to interact with professionals as well as veterans with disabilities.

**3 What is your favorite lecture?**

I often ask the students, "Who is disabled?" For example, what about a wheelchair user who is only able to use his thumb? He can only use his thumb, but he is able to get around independently in his powered wheelchair. And he can use a device to choose words that will be spoken by a speech output system. This happens to be Stephen Hawking, who many consider to be the world's smartest person. Is he disabled? What about superman? Or superman sitting next to kryptonite? Or an amputee with carbon-fiber artificial legs who can run faster than an able-bodied athlete? I sometimes mention an episode of "Outer Limits" in which a person's head is completely covered in surgical bandages. When they are removed, we see a beautiful woman. But she lives in a closed society of disfigured people. Is she disabled?

What I try to do here is to put a human frame around disability. It is all too easy to talk about body parts and function—arms, legs, walking, etc.—but you lose the concept of the person. I have a photograph of a colleague who is of short stature and I ask the class how they should refer to him. As a midget? A dwarf? A scooter guy, since he rides one? When I click to the next slide, it says "Bob"—we call him Bob, because that's his name. You want to refer to the person, rather than use labels.

## 4 Students are tasked with the design of a product to address the needs of individuals with disabilities. What is the process?

The main requirements are that the students address a real need and involve a person with a disability or a health care professional who works with individuals with disabilities. Students work with these individuals as equal members of a team during the definition, design, fabrication, and product-testing phases.

This is where the service-learning component comes into play: a connection is made between students and an individual with a disability or health care professional. I often come up with project ideas for students after asking people in the community for suggestions. There is a group of wheelchair users at the VA who are working with students to develop a device to help them open doors, for example.

## 5 How do you see this class fitting into the concept of public service?

I think that ENGR110/210 is an ideal public service/service-learning course. It exposes students to the concept of assistive technology as they work to solve problems faced by individuals with disabilities in the community. The course lectures are open to the community, so students are able to interact with non-students, including those with disabilities. Community members, in turn, are able to take advantage of the local expertise of the presenters and become involved in projects with the students. Everybody benefits. I believe that all students have a desire to do something socially responsible and that this course provides them with an opportunity to do that.

*To listen to lectures, learn about projects developed in the class, or contact David Jaffe, please visit: [www.stanford.edu/class/engr110](http://www.stanford.edu/class/engr110).*

## Projects from ENGR 110/210

### 2009

- iPhone Dialer for Users with Visual Impairments
- Handi-Cart
- Sonification of Movement
- Opening Doors

### 2008

- LiquidMetal: Redesign of the White Cane
- Let's Get Physical: Pediatric Gait Project
- ElevAid

### 2007

- Aid for Donning an Artificial Leg
- Accessible Fishing Rod
- Aid for Improving Mobility around the Home for the Elderly
- Rain Protection Device for Wheel Chair Users