

**JEFF DUSEK:** My name is Jeff Dusek. I am a course two Ph.D. candidate. My involvement in the class is I'm actually a mentor for two of the student project teams. So Sruthi is on one of the teams-- team Beverly Ann. I also worked with team Art.

And I took this course last year and found it to be an incredible experience. I have an interest in assistive technology that stems from a grandmother who was in a wheelchair growing up. And when I was asked to be involved in the course this year, I was really excited to be involved again and in a mentor capacity was really a great privilege in my opinion.

**SRUTHI NURAYANAN:** My name is Sruthi Nurayanan. I'm course six two, which is ECS. And in this class this year, I was working with Beverly Ann on a grip sensor that would help her detect when her grip was slipping when she was picking up certain objects.

So I was interested in building some sort of technology that would actually go to someone and help them. I hadn't really done that before in a class. And this class was, I guess, pretty well advertised. And I was interested in sort of going forth and just building something, even if it was just for one person. And so that's why I decided to take it.

In terms of how my expectations for the class actually correlated with what the class was like, I think that in some circumstances it really did end up being what I expected. I got to build something, which is really exciting. I learned a lot about circuitry and fields I'd never known anything about before but was really interested in. And all of that was really what I wanted to get out of the class, as well as the joy from being able to make someone something that they're going to use and that will help them. And so that made me really happy.

What I didn't think I would get out of this class-- but I was surprised to-- was sort of the able to interact with people with disabilities and understand how they interact with the world and how assistive technology can really help someone, even if it's just in a very small way. So I learned a lot about that. And I'm glad I took the class for it.

**JEFF DUSEK:** Yeah. So as far as my expectations for the course, one thing I really realized taking this last year is that this class and design-- and iterative design in general really force you to learn skill sets that might not be something that you come in with. So last year we worked on kind of a robotic arm project. I'm a mechanical engineer. And so some of the electronics and the coding

were not really in my wheel house, if you will.

So this year I was kind of the mech-E person of the staff. So what I was hoping was to be able to help teams that needed a little bit more mechanical design, who maybe come from backgrounds in electrical engineering or computer science and stuff, that might not have that skill set. And I think maybe we pulled that off-- would say you have to hear from the teams about that one.

**SRUTHI**

**NURAYANAN:**

So when we have to collaborate with our client, a lot of it was just figuring out what would help her out the most. Because she came and told us immediately. She was, like, I have this disease. And I have bad grip because of it.

And so we had to spend a long time thinking about, OK, what does that mean? What parts of her hand does she grip with? When does her grip slip? Why does it slip? What can we do to prevent it from slipping? What device could we even possibly make?

And so a lot of the time was just spent with her talking with her about her experiences with her disease and sort of figuring out very, very slowly what would actually help her. And then once we were able to get to that point, it sort of snowballed from there. We were, like, OK. We actually know what the problem is now. So we can make this device. And then it was just build, build, build. And then we got it done and it worked.

So for other students or engineers who want to collaborate with clients with disabilities, I think that it's a really valuable experience, and you should definitely go for it. I learned a lot and was able to help someone. And I think that in itself made me really happy.

But in terms of things to keep in mind, the client comes first. And you have to always remember that you are solving their problem, not what you think their problem is. And we had to spend a really long time actually getting to the root of her problem, which is why I think in the end our product worked.

So definitely listen to the client. Try to get as much critical feedback from them as possible, even though sometimes that's hard. Because they're just happy that you're there helping them, even if you're not making them the best thing that you possibly could. And so definitely listen to your client would be the advice I would give.

So I think the group work went really well. We were able to split it pretty nicely into different sections of work. In the beginning we were all pretty much just talking with Beverly Ann a lot about her disease and her problem.

But once we were able to analyze the problem, we were able to pick up niches of the design that we were able to split up pretty evenly and work on and then combine in the end. I think definitely figuring out how to split the work evenly is the hardest part. But once we were able to do that, it went really smoothly.

I would say for our team in particular, none of us had any circuitry experience coming in. And we were making a device that was going to stay on her at all times, and it definitely required a lot of circuitry. So the biggest problem was just figuring out what kind of technology we even had available to use and how we could use that to our advantage, learning about how circuits worked, even at like a very basic level. All of that was just so foreign to us. And so that was definitely the hardest part to get past.

**JEFF DUSEK:**

Yeah, so as a mentor I might have a slightly different perspective on the teaching of the course. And I think a few things are really important. I would say as far as design and design for our client, there's really two things. I would say that making sure that you have a really good contextual inquiry-- so really understand your client and understand the problem. I think that's one thing that this course does that's a little different from most design courses.

You're designing for a single person. And so you really get to interact with that person and understand them and understand their problem. And it's really important to do that. And that's kind of the starting point for everything you do. And so you really need to get that contextual inquiry.

And the second thing that I learned taking the course, but then also working with the teams this year, is just the value of iterative design and prototypes-- no matter what fidelity they are, so even paper things or cardboard things. Sruthi's team with Beverly Ann-- they worked with a grip project. And so they used things like putty to kind of map where the hand grips in particular and those sort of things. And I think that's really valuable-- is making use of even kind of non-technical prototyping but to really better understand the design space.

**SRUTHI**

For the professors and educators for this course who are going to teach it in the future, I think

**NURAYANAN:**

that the thing most important for them to remember is that I think the students all have really

good intentions but don't necessarily know how to act on them. Like in our case, we were just really lost with some of the electrical stuff until we were able to find resources that were able to help us. And so I think the one thing they need to keep in mind is that we definitely are very lost in some of the things we have to learn how to do. And so obtaining as many resources as possible is very useful for us down the road.

So for example, in our case, we were able to use the Cypress Engineering Lab, which has a lot of resources for electrical device development. But we didn't know about it until mid November. So until then we were sort of floundering. And eventually we were able to get into the lab and get a lot of work done, but knowing that earlier would have been helpful. And so just find and exploit all the resources you can get, because they all pay off in the end.

Take this class. I really, really enjoyed it. It's something that I haven't gotten out of a class before, because this actually went to someone. It wasn't just something that I built and then dropped at the end of the class. It is actually going to help someone live their life in a better way. And that's just incredibly rewarding.