

# The Next Big Thing

The objective of this course was to introduce the students to the tools needed in electrical engineering, reinforce and motivate concepts in physics related to electricity and magnetism, to introduce the students to some aspects of product development, and to have fun. In this course we underwent two major product development projects and several smaller projects.

## Van de Graaf Generators

The beginning of the physics portion of the cohort dealt with electrostatics. In order to help illustrate some of the basic concepts we had student teams build Van de Graaf generators. These devices, which many of you have seen at museums, are large spheres that can accumulate electric charge, with shocking results. The assignment was to develop a working Van de Graaf generator as though you were designing for a company that developed educational toys. The final prototypes are shown at the front of the room, though the product ideas are not accompanied by the explanation that is necessary. This project took the first four weeks of the course and all the generators worked at the end of the assignment. One generator was even used by an area middle school student in science fair project on static electricity.

## Circuits

The middle portion of the course focused on building circuits and electronic devices with an emphasis on basic wireless communication. The students built a variety of devices such as an AM radio, AM transmitter, and transmitters and receivers based on pulse width modulation. This was an opportunity for students to learn the different tools in the lab, basic circuit components, and circuit design.

## Wireless Products

The students then spent the last five weeks of the course working in teams to build their own new product using basic wireless transmission. The student teams were to develop their own original ideas into proof of concept prototypes using low-level circuit components. The result is the variety of projects that you see in this room today.

The students had many constraints in completing these projects and what we show today is only a snapshot of what the students learned over the entire semester. For simplicity of the instructors, we used the same components to build all the remote devices in the class. Therefore, the many of the products interfere with each other as they all operate on the same frequency. Also, some of the products may not be working today which in most cases does not reflect the amount of time the students spent on the project and the amount of understanding the students have.

The teams you see in this room today are:

- **Mail Check** Nicole Hori, Erin McCusker, Steve Shannon and Alex Valdivia.
- **Firenet** Etosha Cave, Will Clayton, Drew Harry, and Sharon Talbot.
- **Power Pad** Leighton Ige, Bret Richmond, and Jeff Satwicz.
- **RC Laser Renegades** Ransom Byers, Tom Cecil, Frances Haugen, and Dan Lindquist.
- **Wireless Metronome** Grant Hutchins, Cheryl Inouye, Dylan Sanders-Garrett, and Sarah Zwicker.
- **ASK!** Jay Gantz, Chris Murphy, and Que Anh Nguyen.
- **Squirrel Shocker** Seth Heltsley, James Krejcarek, Kate Walsh.
- **Wireless Wakeup** Luaren Cagle, Jon Chambers, Suttee Dee, and Sean Munson.

I hope that you will look at all the products and tell the students what you think of the potential for their ideas and provide constructive feedback.

Enjoy.

Brian D. Storey

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