



Capstone Project Information Sheet

Electrical & Computer Engineering

Electrical and Computer Engineering students are equipped with a variety of skills in both hardware and software that they apply to their capstone/senior design projects. These projects focus on developing solutions to complex engineering design problems using their skills and knowledge.

Student Skills:

1. **Design and Analysis of Electronic Systems:** Ability to design and build discrete electronic circuits and digital logic circuits, and analyze them using circuit laws, simulation, and signal analysis.
2. **Computing and Embedded Systems:** Understanding of how to use MATLAB and C coding to program sophisticated microprocessors.
3. **Electrical Systems:** Knowledge about electromagnetics, power and renewable energy, signals and controls, and nano systems.
4. **Software Systems:** Knowledge about software engineering, data structures, digital electronics, and hardware-software interfacing.
5. **Verification and Validation:** For both hardware and software systems.
6. **Project Management:** Examination of customer requirements and engineering specifications and constraints with respect to risk management and safety assessment.
7. **Additional Skills:**
 - Consideration of ethical, global, and cultural implications of design projects
 - Dissemination of results through oral presentations
 - Documentation including written reports, operating manuals, and test plans

Previous Projects:

Electrical Engineering:

- **Ferguson Control Systems:** Constructed a semiautonomous robot that interacts with spectators at sporting venues and provides information based on a voice-activated input.
- **Omron:** Built a “pick-and-place” system controlled by Omron Programmable Logic Control (PLC) devices. This system was used to build a robot that autonomously builds an electric circuit and another that sorts parts based on color and shape.
- **Other:** Built a working, home-made version of a Segway with a variety of safety features.

Computer Engineering:

- **Williams:** Designed a user-friendly computer interface for a program used to size and characterize gas compressors.
- **UH BRAIN Center:** Involved in several projects designed to help children with neuro-muscular disabilities by modeling and building exoskeleton systems.
- **Farmers in Nicaragua:** Built a computer-automated drip irrigation system used by farmers in Nicaragua.