EE J-term Course: ENGR296

Introductory Topics in Electrical Engineering: A Make/Build/Discover Adventure

A hands-on project-oriented course with enough basic theory to understand the underlying concepts, taught through construction of useful devices. The course will focus on making things, developing practical skills, and venturing out to see electrical engineering in action. It offers an opportunity for students of all backgrounds to consider electrical engineering as a discipline, and provides EE students a skills practicum and topical introduction to concepts they will study in the EE program. This 2-credit course will count toward the elective requirement in the EE program.

Theoretical/Hands-on Content: Learn about…

- Analog Electronics
  - Voltage, current, resistance
  - Lab tools (Power supplies, oscilloscopes, function generators, etc
  - Lab measurements (measuring resistance, voltage drops and currents, proving laws)
  - Circuit components (resistors, diodes, LEDs, capacitors, amplifiers, etc)
- Digital Electronics
  - Basic concepts of logic (theory, philosophy, problem-solving)
  - Logic electronics (AND, OR, NOT)
  - Data and decision making (Input conditions >> decision parameters >> output)
  - Digital logic circuits (simple voting machine, custom application design, etc.)

Math Content: Adapting familiar math topics into engineering tools

- Algebracadabra
- Log rolling
- Sines of the times (sinusoidal functions as signal models rather than computational tools)
- Pythagoras, the impossible, and the magic of complex algebra (that's a "j" not an "i")
- Binary beauty and hex appeal

Project Content

- Selected lab experiments: fun, simplicity, accessibility
- Course project: tie it all together and build a tangible result
- Lab skills: wiring tools, breadboarding, soldering, PC board design, etc.

Industry Content

- Tours of local sites that showcase electrical engineering in action: Product developers, engineering firms, power plants, broadcast networks, etc. (such as 3M, Honeywell, Cray, Medtronic, MPR,…)
- Visitors from Industry to bring perspective, examples and stories

For more Information Contact Chris Greene or Andrew Tubesing