**Course Description:**
Design of electronic circuits for applications in instrumentation, communication, control, and power systems.

**Prerequisites:**
ECE 3410

**Textbook:**

**Course Outcomes:**
1. Students are able to model and analyze the performance of discrete npn and pn BJT devices with regard to DC bias, small signal voltage and current gain, input and output impedances and power dissipation.
2. Students are able to analyze npn and pnp based BJT amplifiers using discrete components in common emitter, common based and common collector circuit configurations.
3. Students are able to model and analyze the high frequency signal transfer characteristics, including gain and input/output impedances of npn and pnp analog amplifiers.
4. Students are able to model and analyze differential and multistage amplifiers using MOSFET and BJT discrete and integrated circuits.
5. Students are able to design and use resistorless DC bias approaches and resistorless transistor loads for integrated circuit design.
6. Students are able to model, analyze, design and test MOSFET and CMOS inverter circuits for digital logic gate configurations.
7. Students experience microelectronic circuit applications such as signal amplification, wave-shaping, feedback-filtering, buffering, AD/DA converters, digital logic processing, memory subsystems and power amplifiers.

**Topics Covered:**
- Physics of Semiconductors
- Review of MOSFETs
- Amplifier Building Blocks
- Differential Amplifiers
- High-Frequency Device Models
- Feedback Networks and Stability
- Digital Logic Circuits
- Memory Circuits
- Power Amplifiers
- Filters and Oscillators
- Signal Generators and Oscillators
Outcome Assessments (Grades):
   Homework     25%
   Lab          25%
   Final Project 50%

Class Schedule:
   Class        Three times a week for fifty minutes.
   Lab          Once a week for two hours and forty-five minutes.

Contribution of course to meeting the requirements of Criterion 5:
   3 credit hours of Engineering Topics and contains significant engineering design content

Relationship of course to student outcomes:
   a. An ability to apply knowledge of mathematics, science, and engineering.
   c. An ability to design a system, component, or process to meet desired needs.
   e. An ability to identify, formulate, and solve engineering problems.
   k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Instructor:
   Kylee Sealy,
   August 2013