**ELEN 3035: Analog Electronic Laboratory**

**Class Schedule:**  1 hour lecture and 3 hours lab equivalent to two credits

**Course Coordinator:**  Susan C. Schneider

**Course Materials:**

* Texts from ELEN 2020 EECE 3010 and ELEN 3030
* ELEN 3035 Parts Kit
* All lab supplies, tools and materials from ELEN 3025
* Meterman 15XP DMM, or equivalent hand held DMM
* Microsoft OneNote
* William S. Pfeiffer, “Technical Communication”, Pearson Education, 7th Edition, 2010

**Course Information**

Gain experience in the design, assembly, testing, and trouble-shooting of analog electronic circuits. Experiments encompass a wide range of topics such as amplifiers, filters, power supplies, power control, oscillators, and communication circuits. Transistors, op amps, general purpose, and specific purpose devices are used.

**Prerequisites:** ELEN 3030 and ELEN 3025

**Required course**

**Elective in** COEN Hardware area (depth only – taking this **and** ELEN 3025 counts as a single breadth course)

**Contribution to Professional Component:** Engineering Science 50% and Engineering Design 50%.

**Course Goals:**

* Extend skills learned in ELEN 3025.
* Apply theory learned in ELEN 3030 including small signal and large signal, linear amplifier design, negative and positive feedback amplifier applications, operational amplifier applications, and frequency response concepts.
* Utilize LabVIEW software for Data Acquisition and analysis.
* Design circuits, conduct experiments, and analyze data for specified applications.
* Prepare written documentation including formal written reports.
* Provide oral reports to demonstrate competence in data acquisition and understanding of circuit construction and function.

**Course Objectives:**

By the end of this course, you should be able to...

* Design, build, test, troubleshoot, and evaluate analog circuits that incorporate several stages of active components and/or advanced data acquisition and analysis.
* Use computer software such as Multisim, Excel, and LabVIEW to design and analyze specified circuits and applications as well as the Student Selected Design Project.
* Evaluate and revise designs as actual performance is reviewed.
* Prepare a written report that effectively communicates the objective, the design procedure, the experimental results, and the conclusion for a design project.
* Provide an oral explanation of the design, simulation, construction, testing, and data analysis for a design project.

**Partial fulfillment of Criterion 3 objectives A, B, C, E, G, I, and K.**

**Course Topics:**

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| Project # | Title | Project duration | Concepts Investigated | Report format1 |
| “0” | Lab Setup | 1 week | Organization  Equipment operation review |  |
| 1 | Operational Amplifier Applications | 3 weeks | (1) Current sources; differential amplifiers;  (2) op-amp AC and DC error sources;  (3)2 “new” applications (\*) | Oral – VOPPT |
| 2 | “mySpeaker” | 4 weeks | Design of an audio amplifier to interface between 100 W speakers and personal audio sources (iPhone) | Written |
| 3 | “Team Choice” | 5 weeks | Multiweek project in which students design, build and test a system to meet self-imposed specifications drawing upon all relevant electrical engineering concepts | Poster, Written, Demonstration |