Course Description

EE 1110 Measurements Laboratory

2002 – 2003 Catalog Data
Introduction to Electrical Engineering laboratory procedures, causes and corrections of errors in measurements, theory of operation and usage of basic Electrical Engineering test instruments, and report writing. Prerequisite: EE 1305

Prerequisite by Topic: Elementary networks and algebra

Course Outcomes: Students completing EE 1110 will be able to:

1. Demonstrate competence in the use of a Digital Volt Meter.
2. Design and implement a basic DC electrical circuit, using passive components.
3. Understand basic techniques for analyzing data.
4. Understand basic concepts of 1-dimensional and 2-dimensional signal processing.
5. Demonstrate competence in written technical communication.

Topics Covered:
1. Data analysis and Resistance
2. Series, parallel and series-parallel DC circuits
3. DC voltage and current division
4. Basic properties of time-domain signals
5. Aliasing and synthesis of signals
6. Bandwidth and signals
7. Finite Impulse Response filter
8. Video quantitization and sampling
9. Image manipulation and processing
10. Nonlinear image processing

Class Schedule
One hour of lecture per week
One hour and fifty minutes of laboratory per week

Contribution to Professional Component:
EE 1110 is a required freshman course that provides Fundamentals of circuit theory, data analysis, signal processing and written communications.
Relationships to Program Outcomes:

1. Have an ability to apply knowledge of mathematics, science and engineering. Students use concepts from algebra in the analysis of a DC circuit of passive components.

2. Have an ability to design and conduct experiments; analyze and interpret data. Students learn basic data-gathering and simple analysis techniques; mean, median, mode, standard deviation, and the Least Squares curve-fit.

3. Have an ability to design a system or component to meet desired needs. Students learn to design and implement basic electrical circuits such as voltage dividers, using passive components.

5. Have an ability to identify, formulate and solve engineering problems. Students are challenged to identify, formulate, and solve engineering problems in every lab.

7. Have an ability to communicate effectively. Students write weekly reports on laboratory experiments. Students also write a term project consisting of an informal proposal.

11. Have an ability to use the techniques, skills and modern engineering tools necessary for engineering practice. Students learn the use of basic circuit analysis tools, such as digital voltmeters, as well as drag-and-drop computer tools and basic signal processing tools.

Course outcomes do not relate to program outcomes 4, 6, 8, 9 or 10. Course outcomes do correlate to educational outcomes 1, 2, and 3.

Computer Usage: Extensive use is made of Hyperception’s Visual Application Builder, to perform 1-dimensional and 2-dimensional signal processing. Two experiments use LabView software. All reports are written using a word processor.

Prepared by: Alan Taylor, Associate Instructor