



CGN 3710 -- EXPERIMENTATION AND INSTRUMENTATION FOR ENGINEERS

GOALS: To master the fundamentals of electrical circuits: to use these in addition to your knowledge of math, science and engineering - setup, calibrate and use various electronic sensors in conjunction with digital oscilloscopes and data acquisition equipment.

OBJECTIVES: You will be able to analyze and solve DC and AC circuits, connect voltmeters and power supplies to strain gages and other types of sensors and conduct experiments using the devices. Based on the output from the sensors, you will be able to reduce the raw data, and formulate an engineering conclusion based on the results.

OUTCOMES: You should be able to successfully complete the electrical portion of the "FUNDAMENTALS OF ENGINEERING" EXAM (FE). You should possess the knowledge and experience to specify, connect, conduct and reduce the output from the sensors that are commonly used in industry.

COURSE OUTLINE

FALL 2002

INSTRUCTOR: Dave Bloomquist, P.E. 209 Reed Lab, 392-0914
Office hours: T - TR 1st and 7th periods + anytime I'm in my office
Graduate Assistant: Christi Grover (Wed and Thurs. - 7th Period)
Melissa Crosby (Monday - 10:30 - 3:00)

REFERENCES:

1. **Overhead Notes** for CGN 3710 (purchase thru ASCE Rm 203A Weil) - **(Required)**
2. **Lab Reports** for CGN 3710 (available on WebCT)
3. **Electric (Electronic) Circuits Fundamentals** - Floyd (Hub) - good reference book, but only needed for 1st part of course so iffy.....
4. **WebCT website:** www.webct.ufl.edu

LECTURE SCHEDULE: T, Th, 2nd AND 3rd PERIODS 2nd - Matherly 251
3rd - Weil 273

LAB SCHEDULE:

T	3:00 - 5:15 pm, 107 Weil Hall (Annex - Soils Lab)
Th	3:00 - 5:15 pm, 107 Weil Hall (Annex - Soils Lab)
Wed	3:00 - 5:15 pm, 107 Weil Hall (need as many as possible from Tuesday lab to switch to Wed, if possible (possible food on Wed.))

Date	Lecture Topic	Lab (note: weekly schedule - not daily)
Aug 27	Introduction + WebCT + Keirse Test	Overview + Lab Scheduling Details
Aug 29	Basic Concepts in Electricity	
Sept 3	Resistance & Ohm's Law	Use of multimeter (resistance, voltage, current) (PreLab)
Sept 5	Kirchhoff's Law	
Sept 10	DC Circuit Analysis	Basic DC Measurement (Lab #1)
Sept 12	Strain Gages	
Sept 17	Strain Gages (cont.)	Static Strain Measurement (Lab #2)
Sept 19	Strain Measurements	
Sept 24	Operational Amplifier	Digital Oscilloscope (Lab #3)
Sept 26	Capacitance	
Sept 25	Inductance	Dynamic Strain Measurement (Lab #4)

Sept 27	Review for Test	
Oct 1	TEST NO. 1	NO LAB
Oct 3	Load and Pressure Measurement	
Oct 8	Phasor Notation/Manipulation	Load Cells & Pressure Transducers (Lab #5)
Oct 10	Introduction to AC Circuits	
Oct 15	AC Circuit Analysis	Problem Session (Review for FE exam)
Oct 17	Power in AC Circuits	
Oct 22	Dial Gages & LVDTs	LVDTs (Lab #6)
Oct 24	Transformers	
Oct 29	AC Problems (Refl. Impedance)	NO LAB / AC Review for Test
Oct 31	AC Problems (Thevenins)	
Nov 5	AC Review for Test	NO LAB
Nov 7	TEST NO. 2	
Nov 12	Flow Measurement	Flow Measurement (Lab #7)
Nov 14	Temperature & Humidity Meas.	
Nov 19	pH and Viscosity Measurement	Temperature & pH Meas.(Lab #8)
Nov 21	Velocity Sensors & Accelerometers	
Nov 26	Viscosity Measurement	NO LAB
Nov 28	NO CLASSES!!!	
Dec 3	Data Acquisition	Data Acquisition System Demo.
Dec 5	Data Acquisition (cont.)	
Dec 10	Review	
	TEST NO. 3	Dec 19 th at 5:30 P.M. (Section 0892) Dec 20 th at 10:00 A.M. (Section 0893)

Grade Evaluation

Grading Scale

<u>Points</u>		365.0 - 400	A
Test #1	100	349.0 - 364.9	B+
Test #2	100	325.0 - 348.9	B
Test #3	100	309.0 - 324.9	C+
Lab Reports	100	285.0 - 308.9	C
		269.0 - 284.9	D+
TOTAL	400	245.0 - 268.9	D

GRADING POLICY:

- No make-up tests will be given except for medical reasons or unless arrangements have been made prior to tests. Lab material will be on tests.
- Lab reports are due one week following the lab at the **beginning** of the lab period. A penalty of 10% per school day shall be assessed on materials turned in late.
- Attendance in lab is required in order to get credit for the lab.