

Syllabus-PHYS 2883-Electronics I- Fall 2006

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Physics Dept.

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Office hours: *Monday: 3:30-4:30pm, Tuesday: 10:30am-12:00n*

Textbook: Principles of Electronic Instrumentation by *James Diefenderfer*

We will use the electronic circuit simulation software “Multisim” in constructing our circuits, extensively.

Exams/homework/lab reports:

- There will be two hourly tests and a final exam.
- The electronic laboratory sessions will follow the lectures and will be in 2:30 hour periods. You will be working in groups of two.
- The lab reports are due one week after the lab is finished.
- Weekly homework assignments and lab reports will be graded.

Lectures will be tablet PC based and we will make use the interactive tablet PC server/software DyKnow, which will be introduced by Prof. Sahiner.

Attendance/Participation: Attendance is required for each lecture; class participation (questions/discussions) is strongly encouraged.

Final Grade: Exams I and II 20% + Final Exam 30% + Lab reports 35% + Homework 15%.

The course will cover the following subjects:

- Electrical Circuit analysis
 - Ohm's law, Kirchoff's laws
 - Circuit elements
 - Voltage sources, resistors, capacitors, inductors, ammeters, voltmeters, ohmmeters.
- Use of oscilloscope
- AC circuits
 - Impedance, reactance

- Filters, rectifiers, resonating circuits
- Diodes/transistors
- Operational amplifiers
- Feedback systems in amplifiers
- Digital circuits
 - Boolean algebra
 - Logic gates
 - Flip-flop circuits
 - Analog to digital, digital to analog converters
- Electrical Noise
- Signals and systems
 - Signal Sampling and Nyquist criteria
 - Signal processing and modulation (Amplitude and frequency modulation)

Weekly Laboratory Shedule:

1. Preliminary Remarks, Resistive Circuits, Applications of Ohm;s Law
2. AC circuits, Oscilloscope, RMS Voltage , RC circuits
3. Electronic Workbench (EWB) , Integrator, differentiator, half wave rectifier , low-pass, high pass filters
4. Diodes and integrated circuit LM 555: Temperature to frequency transducer
5. Operational Amplifiers I (OP741)
6. Operational Amplifiers II (OP 07 Differentiator)
7. Analog to Digital Converters
8. Digital Circuits I, Gates and Logic Circuits
9. Digital Circuits II, Digital Counters
10. Flip/Flop Circuits, Multisim Applications of Digital Circuits
11. Non-inverting amplifier and summing amplifier with Analog to Digital Converter

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<http://studentaffairs.shu.edu/health/DisabilitySupportServices.html>