Course Outline

Course Description (UVM 2001-2002 Catalogue): Introduction to analog and digital electrical measurements and circuits; introduction to microprocessors. No credit for EE majors. Prerequisite: Physics 42 with 22 or 125. Four hours.

Class Time: TR 0930 – 1045

Instructor Office Hours: TR 1100 – 1200 & by appointment

Textbooks: Introduction to Electrical Engineering by J. David Irwin & David V. Kerns (Prentice-Hall)
Engineering Problem Solving with MATLAB by Dolores Etter (Prentice-Hall)

Prerequisite Physics Text: R. Wolfson & J. Pasachoff, Physics for Scientists and Engineers (Addison-Wesley).

Course Outline
Chapter 1. Introduction – Review Chapters 23-34 of Wolfson & Pasachoff
Chapter 2-4. Basic Circuit Analysis – Review Chapters 28 & 33 of Wolfson & Pasachoff
Chapter 5. Steady State Power Analysis & Transmission Lines – Review Chapter 31 of Wolfson & Pasachoff
Chapter 6. Network Frequency Characteristics - Review Chapters 15 & 33 of Wolfson & Pasachoff
Chapter 7. Overview of Basic Concepts in Electronics
Chapter 8. Semiconductors, Diodes, and Applications
Chapter 9. The Transistor as a Switch: FETs & BJTs for Digital Applications
Chapter 12. Microprocessor Systems

Weekly Problem Assignments & Exams:
Problem assignments will be assigned on Tuesday of each week and will be due the following Tuesday. Each student is required to pass in their own handwritten assignment (photocopies, computer printouts, etc. of assigned problems are not acceptable). There will be a 15 minute exam at the end of class each Tuesday on the material covered in the problem assignment that is due that day. You may use your assigned problem solutions as a guide during that exam (but no other unapproved materials) and both must then be handed
in stapled together at the end of class. Unless explicitly stated otherwise, there will be no partial credit given on any of the exam questions.

Each weekly exam grade contributes equally to the final 3/4 grade for the 3-credit course; the other 1/4 comes from the final exam).

**Final Exam:** Friday, December 12, 2003, 0800 – 1100.
The final exam will cover all of the course material covered in Chapters 1 through 9 and Chapter 12. The final exam = 25% of the final course grade.

**Laboratories:**
The laboratories account for one credit and will be assigned by the laboratory instructors. A detailed description of each laboratory may be found in pdf format on my UVM website (www.emba.uvm.edu/~oughstun/). The laboratory schedule is as follows:


Lab 2: Current Divider, Ammeter, Voltage Divider, Homemade Voltmeter, Wheatstone Bridge.

Lab 3: The Digital Oscilloscope: Voltage vs. Time, Memory Buffer, Trigger (Amplitude & Slope), Phase Measurements.

Lab 4: RC Circuits, Filters.

Lab 5: Diode I-V Characteristics, Two-Sided Diode Clipper, DC Power Supply.

Lab 6: N Channel FET Common Source Transistor Amplifier (DC Behavior & AC Behavior), Frequency Selective Amplifier (an Active Filter).


Lab 8: Motor Control Fundamentals, Power MOSFET.

Lab 9: Diode Logic AND Gate, TTL AND Gate, Building an RS Flip-Flop.

Lab 10: AND/Invert Glitch Circuit, 74834-bit Adder, 7490 Counter.