

**ECE113LA ELECTRONICS I LABORATORY
FALL 2003**

Catalog Data:	ECE113LA Electronics I Laboratory (Credit Units: 1) F. Laboratory accompanying Engineering ECE113A to perform experiments on semiconductor material properties, semiconductor device physics and operation principles, and transistor amplifiers to improve experimental skills and to enhance the understanding of lecture materials. Corequisite: ECE113A. Prerequisites: Physics 7E, ECE70A, ECE70B. (Design units: 1)
Textbook:	Electronics I Laboratory Manual , Chin C. Lee, U.C. Irvine, 2002
References:	None
Coordinator:	Chin C. Lee
Course Objectives:	<ol style="list-style-type: none">1. To conduct relevant experiments and improve experimental skills2. To write clear and concise experimental reports3. To work together in a team4. To enhance the understanding of ECE113A lecture materials.
Course Outcomes and Relationship to Program Outcomes:	<ol style="list-style-type: none">1. Students learn modern electronic equipment (Program Outcome 10)2. Students are able to characterize semiconductor diodes and transistors (Program Outcome 2, 3)3. Students build basic RC circuits and measure them (Program Outcome 2, 3, 4)4. Students design, build, and measure a single-stage transistor amplifier (Program 2, 3, 4)5. Students interpret measurement data and write clear laboratory reports (Program Outcome 4, 9).
Prerequisites By Topic:	Calculus, fundamental electromagnetic theory, fundamental atomic physics, basic quantum mechanics, and fundamental circuit analysis
Laboratory Projects:	<ul style="list-style-type: none">-Introduction and equipment operations-Soldering technique and RC filters-Characterization of semiconductors-Characterization of P-N junction and Schottky diodes-Transient responses of diodes-Characterization of bipolar junction transistors and MOSFETs-Bipolar junction and MOS transistors as switches-Bipolar junction transistor amplifier
Class Schedule:	Students are assigned to 3 hour laboratory per week
Computer Usage:	Computers are used extensively to communicate with equipment and to grab and store data for further processing and print out
Professional Component:	Contributes to both the Electrical and Computer Engineering major requirements as 1 unit of engineering science required in the Professional Component

Design Content Description: Six of the eight experiments are devoted to design of (a) technique for measuring the impulse and frequency responses of RC circuits, (b) measurement techniques of p-n junction diodes and Schottky diodes, (c) technique for measuring the input and output characteristics of bipolar junction transistors, (d) inverter circuits, (e) single-stage transistor amplifier.

Approach: Laboratory - 100%

Grading Criteria:	Laboratory reports	50%
	Quiz	50%

Estimated ABET Category Content: Use percentages

Engineering Science: 0 credit units or 0%

Engineering Design: 1 credit units or 100%

Prepared by: Chin C. Lee

Last modified: April 2003