

EE 323L Microelectronic Circuits I Laboratory

Credits: 1

Categorization of credits: engineering topic

Instructors or course coordinator: Aaron Ohta

Textbook and Other Required Materials:

EE 323 Laboratory Manual

Designation: Required

Catalog Description: EE 323L Microelectronic Circuits I Lab (1) (1 3-hr Lab) Experiments on linear and logic properties of diodes and transistor networks. Pre: 213. Co-requisite: 323. DY

Pre- or Co-requisites: Pre-req: EE 213 (Basic Circuit Analysis II); Co-req: EE 323 (Microelectronic Circuits I).

Class/Lab Schedule: one 3-hour lab per week.

Topics Covered:

- Introduction to PSPICE. (1 week)
- Junction diodes basics, diode action, rectifying and filtering, large and small signal models. (2 weeks)
- Operational Amplifier basics, explorations, experimentation and interpretation of inverting and non-inverting amplifiers. (2 weeks)
- Voltage and current offsets, frequency effects. (2 weeks)
- MOSFET measurements, use as switches (1 week)
- MOSFET measurements, use as single-stage amplifiers (2 weeks)

Course Objectives and Their Relationship to Program Objectives:

Understand and develop proper procedures in conducting experimental investigation, proper use of test equipment, recordation of experimental data and analysis. Interpretation and report preparation and submittal. Develop cooperative habits in effectively carrying and experiments. [Program Objectives this course addresses: 1, 2, 3, 5.]

Course Outcomes and Their Relationship to Program Outcomes:

The following are the course outcomes and the subset of Program Outcomes (numbered 1-7 in square braces "[]") they address:

- Hands-on and realistic measurements of topics covered in the lecture course [1, 2, 5, 6]
- Design, build, and test circuits using diodes, op amps, and MOSFETs [1, 2, 5, 6]
- Submit lab reports with adequate analysis of data [1, 2, 3, 5, 6]

- Understand and implement best practices in an electronics laboratory setting [1, 2, 3, 4, 5, 6]

Contribution of Course to Meeting the Professional Component

Engineering Topics: 100%

Computer Usage:

Students use SPICE for circuit simulations. Students use word processing software for writing lab reports and Microsoft Excel or MATLAB for the processing of data and presentation of charts and graphs. The course has a web site, which has downloadable lecture and lab notes, and assignments.

Design Credits and Features:

EE 323L has 1 design credit. The design aspect is making the necessary adjustments, corrections, and modifications to experimental set up to get it to perform as required.

Person Preparing Syllabus and Date: K. Najita, Feb. 2003. Modified by A. Ohta, Jun. 2009; A. Ohta, Oct. 14, 2014; A. Ohta, Jan. 14, 2021.