1. *Course number and name*

**ENGR 206: Circuits and Instrumentation Laboratory**

1. *Credits, contact hours, and categorization of credits in Table 5-1 (math and basic science, engineering topic, and/or other).*

1 Credit; one 2 hour 45 minute lab session/week

1. *Instructor’s or course coordinator’s name*

Mojan Nourizi

1. *Text book, title, author, and year*

Circuits and Instrumentation Laboratory Manual, on ENGR 206 website

1. *Specific course information*
2. *brief description of the content of the course (catalog description)*

Introduction to electrical measurements and laboratory instrumentation. Verification of circuit laws and theorems. Basic operational amplifier circuits. AC steady-state behavior and frequency response. Transient characteristics of first-order circuits. Introduction to PSpice.

1. *prerequisites or co-requisites*

[ENGR 205](http://www.sfsu.edu/~bulletin/courses/21056.htm): Electric Circuits (may be taken concurrently)

1. *indicate whether a required, elective, or selected elective course in the program*

Required for Electrical, Mechanical and Computer Engineering programs.

1. *Specific goals for the course*
2. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

The student will demonstrate:

* ability to work with power supplies
* ability to work with signal generators
* ability to work with multimeters
* ability to work with oscilloscopes
* ability to measure voltage, current, time, and relative phase angles in an electric circuit.
* knowledge of loading effects and instrumentation errors in physical measurements.
* ability to implement simple linear circuits from schematic diagrams.
* knowledge of simple linear circuits by relating observed results to theory.
* ability to present technical information in written form.
* basic knowledge of PSpice for steady state and transient analysis of simple circuits.
1. *explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): 1, 2

1. *Brief list of topics to be covered*
* Laboratory Procedures and Safety
* Digital Multimeter and Power Supply
* Kirchhoff's Laws
* Circuit Analysis and Equivalent Circuits
* AC Measurements
* Oscilloscopes
* Characteristics of Waveforms
* Time-Domain Analysis
* Frequency-Domain Analysis
* Operational Amplifiers
* PSpice analysis of RC circuits