San Francisco State University  
School of Engineering  

Course Outline for ENGR 206 Electric Circuits and Instrumentation

**Bulletin Description:**
ENGR 206 Electric Circuits and Instrumentation (1 unit)  
Prerequisite: ENGR 205 (may be taken concurrently)  
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/B2Spice. Extra fee required.

**Manual on Website:**
   http://www.sfsu.edu/~ee/206/  
   User: engr206, Pass: e206f16

**References:**
1. Electric circuits textbook used in ENGR 205  
2. Technical and operating manuals for various instruments used in the lab.  

**Prerequisites by Topic:**
1. Electrical quantities and units  
2. Ohm's and Kirchhoff’s laws  
3. Linearity and superposition  
4. DC circuit analysis  
5. Characteristics of waveforms  
6. AC circuit analysis  
7. Operational amplifiers  
8. Frequency-domain analysis  
9. Transient behavior of simple circuits  
10. Working knowledge of desktop computers

**Course Objectives*:  
1. To become familiar with the operations of basic laboratory instruments through hands-on experimentation. [A.3, B.3]  
2. To develop a better understanding of the concepts in linear electronic circuits by observing and interpreting the behaviors of real circuits. [A.3, A.5, B.2]  
3. To acquire a rudimentary knowledge of a computer-based circuit analysis software, Pspice/B2Spice. [B.3]  
* Indices in brackets refer to the objectives and outcomes of the School of Engineering.

**Topics:**
1. Laboratory Procedures and Safety
2. Digital Multimeter and Power Supply
3. Kirchhoff’s Laws
4. Circuit Analysis and Equivalent Circuits
5. AC Measurements
6. Oscilloscopes
7. Characteristics of Waveforms
8. Time-Domain Analysis
9. Frequency-Domain Analysis
10. Operational Amplifiers
11. Pspice/B2Spice analysis of RC circuits

Professional Component:
Engineering Design 100%
Engineering Science 0%

Evaluation:
1. Lab reports 50%
2. Quizzes 25%
3. Final Exam 25%

Performance Criteria*:
Objective 1:
1.1 The student will demonstrate an ability to work with power supplies. [1, 2, 3]
1.2 The student will demonstrate an ability to work with signal generators. [1, 2, 3]
1.3 The student will demonstrate an ability to work with multimeters. [1, 2, 3]
1.4 The student will demonstrate an ability to work with oscilloscopes. [1, 2, 3]
1.5 The student will demonstrate an ability to measure voltage, current, time, and relative phase angles in an electric circuit. [1, 2, 3]
1.6 The student will demonstrate knowledge of loading effects and instrumentation errors in physical measurements. [1]

Objective 2:
2.1 The student will demonstrate a skill to implement simple linear circuits from schematic diagrams. [1, 2, 3]
2.2 The student will demonstrate knowledge of simple linear circuits by relating observed results to theory.[1]
2.3 The student will demonstrate ability to present technical information in written form. [1]

Objective 3:
3.1 The student will demonstrate basic knowledge of Pspice/B2Spice for steady state and transient analysis of simple circuits. [1]

Numbers in brackets refer to evaluation methods used to assess student performance.

Instructor: Mojan Norouzi
Emil: mojan@sfsu.edu
Office Hours: SCI-112, Thursday, 8:55pm-9:55pm

Class/Laboratory Schedule:
One 2 hour 45 minute lab session/week
Policy on Add, Drop and Withdrawal:

Students are responsible for their class enrollments. Students should check their enrollment records periodically throughout the semester to ensure that the enrollment record is correct. Particularly, all students should check their enrollment record a day or two after any enrollment changes are made and take immediate action if the university record does not reflect the changes. Also make sure to maintain a record of any adds drops, or withdrawals. First week through fourth week of instruction is the open add/drop period. No late add will be allowed after the deadline.

Policies on Academic Dishonesty:

You are expected to be honest and ethical in your academic work. Cheating and plagiarism are serious violations of the academic code of conduct. Students who have been found to be cheating will be notified by the professor. Furthermore, their act will be reported to the Office of Student Conduct (OSC). There is a “zero tolerance” policy in effect for cheating in this class. Any assignment or exam that is the product of cheating will be assigning a zero or “F” for that assignment.

No excuses will be accepted if plagiarism is discovered. Plagiarism is defined as using someone else’s ideas or work as one’s own without giving proper credit to the source. The sources include public (books, journals, magazines, newspapers, internet, etc) as well as private (unpublished reports, internal documents, personal work, etc.) materials. The instructor will not accept excuses such as “I forgot to give credit to …,” “It’s an oversight,” or “It’s a clerical error.” Students are solely responsible for materials submitted for the course so “My roommate must have done that without my knowledge” is not an acceptable excuse either. If a submitted work is found to contain plagiarized material, the work will receive zero credit and the student may be reported to the Student Judiciary Affairs for disciplinary actions. Disciplinary actions may include disqualification from the university.

Disability Policy Statement:

Students with disabilities who need accommodations for exams are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) will facilitate the accommodation process for individuals with verified disabilities. If a student is a DPRC client, he/she must present an RAV (Reasonable Accommodation Verification) AND an EAR (Exam Accommodation Request) to the instructor at the beginning of the semester. Students are responsible for submitting the completed EAR form to the DPRC. Any changes to the accommodation require prior approval by a DPRC specialist. Changes cannot be requested during an exam. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu).

Student Disclosures of Sexual Violence:

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Dean of Students. To disclose any such violence confidentially, contact:

The SAFE Place: (415) 338-2208; http://www.sfsu.edu/~safe_plc/

Counseling and Psychological Services Center: (415) 338-2208; http://psyserv.sfsu.edu/
Policy on Observance of Religious Holidays:

If a student wishes to observe religious holidays and such observances require the student to be absent from class activities, it is the responsibility of the student to inform the instructor, in writing, about such holidays during the first two weeks of the class each semester. If such holidays occur during the first two weeks of the semester, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent.