



SACRAMENTO
STATE

Course Change Proposal Form A



Academic Group (College): Engineering & Computer Science	Academic Organization (Department): Electrical & Electronic Engineering	Date: 10/13/2008
Type of Course Proposal: New ___ Change <u>X</u> Deletion ___	Department Chair: Dr. Suresh Vadhva	Submitted by: Dr. Suresh Vadhva
Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes <u>X</u> No ___	For Catalog Copy: Yes <u>X</u> No ___ CCE (Extension): Yes ___ No ___	Semester Effective: Fall ___ Spring <u>X</u> , 2009__

This course replaces experimental course Subject Area (prefix) and Catalog Nbr (course number):	
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Change from:

Subject Area (prefix) & Catalog Nbr (course no.): EEE 108	Title: Electronics I	Units: 3
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Change to:

Subject Area (prefix) & Catalog Nbr (course no.):	Title:	Units:
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JUSTIFICATION:

Prerequisite change only. From EEE 117, EEE 166; Corequisite EEE 108L to EEE 117; Corequisite EEE 108L. There will be no change to the course description or content. At many institutions, the device physics course (our EEE 166) is taught after an introductory electronics course (our EEE 108/108L). The justification is that the students are better prepared to deal with the advanced physics principles governing device operation after they learn the basic behavior of the device. The EEE Department believes that our students will learn more in EEE 166 using this approach. The physics required before EEE 108 is contained in basic physics courses.

NEW COURSE DESCRIPTION: (Not to exceed 80 words and language should conform to catalog copy. See <http://www.csus.edu/acaf/univmanual/crspsl.htm> - Guidelines for Catalog Course Description)

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Note:

Prerequisite: EEE 117 Enforced at Registration: Yes <u>X</u> No ___	
Corequisite: EEE 108L Enforced at Registration: Yes <u>X</u> No ___	
CAN (California Articulation Number):	
Graded: Letter <u>X</u> Credit/No Credit ___	Instructor Approval Required? Yes ___ No <u>X</u>
Course Classification (e.g., lecture, lab, seminar, discussion): C04	Title for CMS (not more than 30 characters): Electronics I
Cross Listed? Yes ___ No <u>X</u>	If yes, do they meet together and fulfill the same requirement, and what is the other course.
How Many Times Can This Course be Taken for Credit? ___1___	
Can the course be taken for Credit more than once during the same term? Yes ___ No <u>X</u>	

FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."
See the example at <http://www.csus.edu/acaf/example.htm>

****Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.**

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

For whom is this course being developed?
 Majors in the Dept ____ Majors of other Depts. ____ Minors in the Dept ____ General Education ____ Other ____
 Is this course required in a degree program (major, minor, graduate degree, certificate)? Yes ____ No ____
 If yes, identify program(s): _____

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? Yes ____ No ____
 If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any). _____

The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.

Approvals: If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

Signatures:

	Date
Department Chair: <i>Samuel Becker</i>	11/14/2008
College Dean or Associate Dean: <i>John DeLorenzo</i>	11/21/08
CPSP (for school personnel courses ONLY)	
Associate Vice President and Dean for Academic Programs	

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean's office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.

EEE 108 ELECTRONICS I

Required Course

2008-2010 Catalog Data: EEE 108. Electronics I. Introduction to electronics, ideal OP-AMPS, BJTs, FETs, DC biasing, VI characteristics, single-stage amplifiers, low frequency small signal models, power supplies and voltage regulation. PSPICE required. Prerequisite: EEE 117; Corequisite: EEE 108L. 3 units.

Text: Sedra and Smith, Microelectronic Circuits, Oxford Press, 5th Edition, 2004

Support Software: Cadence PSPICE

Course Objectives:

1. Students will be able to analyze circuits containing ideal operational amplifiers.
2. Students will be able analyze circuits using large-signal terminal characteristics of semiconductor devices (diodes, BJTs, FETs).
3. Students will be able to analyze a circuit comprising semiconductor devices, resistors, capacitors, and constant voltage and/or current sources in order to find bias conditions.
4. Students will be able to specify the appropriate small-signal model for a semiconductor device and determine its parameter values from its bias conditions.
5. Students will be able to analyze an AC small-signal circuit to determine properties such as gain, input resistance and output resistance.
6. To provide the students with additional capabilities in the use of SPICE-like circuit simulators.

Prerequisites by Topic:

1. Intermediate circuit analysis including Laplace transforms from EEE117.
2. Basic physical concepts of electricity from physics and E17.
3. Exposure to computer-aided circuit simulation (e.g., SPICE).

Topics Covered/Class Schedule/Evaluation:

1. Operational amplifier circuits: Analysis of standard amplifier configurations.
2. Diodes: ideal diodes; diode equation; zener diodes; small signal diode equivalent circuits; rectifier circuits: power supplies.
3. BJTs: DC biasing; small signal equivalent circuits; gain and impedance levels of various configurations.
4. FETs: DC biasing; small signal equivalent circuits; gain and impedance levels of various configurations.
5. Low frequency response: RC coupled amplifiers; selection of capacitors to meet frequency response requirements.

Course Outline:

<i>Week</i>	<i>Topic</i>
1	Introduction
2 & 3	Op-amps
4, 5 & 6	Diodes
6, 7 & 8	BJTs
9, 10 & 11	FETs
12, 13 & 14	Low frequency response of BJT and FET circuits
15	Review
Exam Week	Final Exam

Evaluation:

Four examinations 80%

(Note: there will be two regular midterm examinations and a final examination, as well as an assessment examination near the end of the course.)

Homework and/or SPICE design assignments 20%

Contribution of Course to the Professional Education Component:

- The SPICE assignments require the use of the most popular electronic analysis software. Standard industrial practice is to do a thorough PSPICE analysis before constructing any circuits.
- Many of the homework problems consider the application of electronic components to "real life" situations.
- Science and Design Content Distribution: Science - 2 units or 66%; Design - 1 unit or 33%.

Relationship of Course to Program Outcomes:

- #3. Problem solving: This course applies the fundamentals of circuit analysis to circuits with semiconductor devices. Solutions by sinusoidal steady state methods are used.
- #4. Knowledge of core EEE topics: This course teaches the fundamentals of electronic devices and circuits. This course reinforces the use of many of the analysis techniques taught in EEE 117.
- #7. Use contemporary tools for analysis and design: The course teaches use of large- and small-signal models for the analysis of semiconductor circuits.

Course Coordinator: Tom Matthews

Date: November 13, 2008

EEE 108 ELECTRONICS I

Required Course

2006-2008 Catalog Data: EEE 108. Electronics I. Introduction to electronics, ideal OP-AMPS, BJTs, FETs, DC biasing, VI characteristics, single-stage amplifiers, low frequency small signal models, power supplies and voltage regulation. PSPICE required. Prerequisite: EEE 117, EEE 166. Corequisite: EEE 108L. 3 units.

Text: Sedra and Smith, Microelectronic Circuits, Oxford Press, 5th Edition, 2004

Support Software: Cadence PSPICE

Course Objectives:

1. Students will be able to analyze circuits containing ideal operational amplifiers.
2. Students will build on the principles of device physics to demonstrate a knowledge of semiconductor device operation.
3. Students will be able analyze circuits using large-signal terminal characteristics of semiconductor devices (diodes, BJTs, FETs).
4. Students will be able to analyze a circuit comprising semiconductor devices, resistors, capacitors, and constant voltage and/or current sources in order to find bias conditions.
5. Students will be able to specify the appropriate small-signal model for a semiconductor device and determine its parameter values from its bias conditions.
6. Students will be able to analyze an AC small-signal circuit to determine properties such as gain, input resistance and output resistance.
7. To provide the students with additional capabilities in the use of SPICE-like circuit simulators.

Prerequisites by Topic:

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- #7. Use contemporary tools for analysis and design: The course teaches use of large- and small-signal models for the analysis of semiconductor circuits.

Course Coordinator: Tom Matthews

Date: January 15, 2008