



SACRAMENTO  
STATE

# Course Change Proposal Form A



<b>Academic Group (College):</b> Engineering & Computer Science	<b>Academic Organization (Department):</b> Electrical & Electronic Engineering	<b>Date:</b> 11/9/07
<b>Type of Course Proposal:</b> New <input checked="" type="checkbox"/> Change <input type="checkbox"/> Deletion <input type="checkbox"/>	<b>Department Chair:</b> Suresh Vadhva	<b>Submitted by:</b> Perry L. Heedley
<b>Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b>	<b>For Catalog Copy: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></b> <b>CCE: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b>	<b>Semester Effective:</b> Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/> 2008

<b>This course replaces experimental course Subject Area (prefix) and Catalog Number (course number):</b>	
<b>This Catalog Number (course number) is being replaced:</b>	

**Change from:**

<b>Subject Area (prefix) &amp; Catalog No. (course no.):</b>	<b>Title:</b>	<b>Units:</b>
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**Change to:**

<b>Subject Area (prefix) &amp; Catalog No. (course no.):</b> EEE 234	<b>Title:</b> Digital Integrated Circuit Design	<b>Units:</b> 3
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**JUSTIFICATION:**

Students interested in digital circuit design and layout at the transistor level for mixed-signal integrated circuits (ICs) need a class where they can learn and practice the techniques used to develop custom digital cells, as well as gain experience with typical computer-aided design (CAD) tools used for this purpose. This class will fill this need, providing each student with the background and knowledge needed to design and layout their own individual custom digital circuits. Students will practice these skills through projects where they design, layout and characterize custom digital cells. The equipment and CAD software needed to support this class are already available in EEE.

**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)

The background and techniques needed to design and layout digital circuits at the transistor level for mixed-signal integrated circuits are covered. Topics include the design, layout and characterization of digital logic gates at the transistor level, typical CMOS process flows, device models and physics, and chip level considerations.

<b>Note:</b>	
<b>Prerequisite:</b> EEE 230 or consent of the instructor.	
<b>Corequisite:</b>	
<b>CAN (California Articulation Number):</b>	
<b>Graded: Letter <input checked="" type="checkbox"/> Credit/No Credit <input type="checkbox"/></b>	<b>Instructor Approval Required? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b>
<b>Course Classification (e.g., lecture, lab, seminar, discussion):</b> C4 Lecture	<b>Title for SIS+/CMS (not more than 30 characters):</b> Digital IC Design
<b>Cross Listed?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If yes, do they meet together and fulfill the same requirement, and what is the other course.</b>
<b>How Many Times Can This Course be Taken for Credit? <u>  1  </u></b>	
<b>Can the course be taken for Credit more than once during the same term? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b>	

**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>

**Students will be able to:**

- 1) Analyze, design and characterize CMOS combinational and sequential logic circuits at the transistor level
- 2) Use computer-aided design tools to design and layout digital cells for integrated circuits
- 3) Understand important process and device physics issues and their impact on digital circuits
- 4) Understand important chip level considerations for integrated circuits

\*\*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:

**Exams will include midterm and final exams. Homeworks will also be assigned, as will circuit design and layout projects using CAD tools such as PSpice and LEdit.**

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>Suresh Vedhna</i>	11/15/2007
College Dean or Associate Dean: <i>John Holmberg</i>	11/15/07
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.