**Course Change Proposal**

**Form A**

<table>
<thead>
<tr>
<th>Academic Group (College): Engineering and Computer Science</th>
<th>Academic Organization (Department): Mechanical Engineering</th>
<th>Date: March 12, 2009</th>
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<tbody>
<tr>
<td>Type of Course Proposal: New <em>X</em> Change ___ Deletion ___</td>
<td>Department Chair: Susan L. Holl</td>
<td>Submitted by: Jose J. Granda</td>
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<td>Does this course fulfill a requirement for single-subject or multiple subject credential students? Yes ___ No <em>X</em></td>
<td>For Catalog Copy: Yes <em>X</em> No ___</td>
<td>Semester Effective: Fall <em>X</em> Spring __, 2009</td>
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<td>CCE (Extension): Yes ___ No <em>X</em></td>
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This course replaces experimental course Subject Area (prefix) and Catalog Nbr (course number): Yes ___ No ___

If changing an existing course, should new version be considered a repeat of the original version? If so, the same Course ID will be maintained. If not, a new Course ID will be assigned. Note: In PeopleSoft terminology, the Course ID is the unique system identifier, not the Catalog Nbr.

### Change from:

<table>
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<tr>
<th>Subject Area (prefix) &amp; Catalog Nbr (course no.):</th>
<th>Title:</th>
<th>Units:</th>
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### Change to:

| Subject Area (prefix) & Catalog Nbr (course no.): ME 172 | Title: Control System Design | Units: 3 |

### JUSTIFICATION:

ME114 is being split into two courses. ME172 (Control Systems Engineering), a required class dealing mainly with control systems and ME114 (Vibrations) which deals mainly with vibrations and becomes an elective. The new course will focus on control system design.

### NEW COURSE DESCRIPTION: (Not to exceed 80 words, and language should conform to catalog copy. See http://www.csus.edu/umanual/acad.htm - Guidelines for Catalog Course Description)

Use of mathematical models for the generation of equations of motion for mechanical and electrical systems. Evaluation of single and multiple degrees of freedom systems in the time and frequency domain. Topics include feedback control systems, Laplace transform, state space representation, transfer functions, error analysis, stability of control systems and system response. Automatic control system design using root locus and frequency response methods. Design of compensating controls using state of the art software and automation tools. Introduction to digital control.

**Note:**

- Prerequisite: ENGR 110, ME 105
- Enforced at Registration: Yes _X_ No __
- Corequisite: Yes ___ No ___
- Graded: Letter _X_ Credit/No Credit__
- Instructor Approval Required? Yes ___ No _X_ |

### Course Classification (e.g., lecture, lab, seminar, discussion):

| Title for CMS (not more than 30 characters) | Control System Design |

### Cross Listed?

Yes ___ No _X_ __

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 _X_.

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) Use mathematical modeling techniques to derive differential equations that represent a physical system.
2) Transform mathematical equations into block diagrams to perform time and frequency domain analysis and design.
3) Derive transfer functions and state space representations of physical systems using conventional and automated techniques.
4) Design open loop and closed loop control systems. Evaluate system errors, stability and feedback controls.
5) Use basic concepts of Proportional, Derivative, Integral control and PID controllers.
6) Design feedback control systems using Root Locus and Frequency Response methods.
7) Use the basic concepts of digital control.

**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:

Students will be assessed by quizzes, exams and their final project including an oral presentation and written report.

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): B. S. in Mechanical Engineering

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:

<table>
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<tr>
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<th>Date</th>
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<tbody>
<tr>
<td>Department Chair:</td>
<td>4/24/09</td>
</tr>
<tr>
<td>College Dean or Associate Dean:</td>
<td>4/24/09</td>
</tr>
<tr>
<td>CPSP (for school personnel courses ONLY):</td>
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<tr>
<td>Associate Vice President and Dean for Academic Programs</td>
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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.

9/10/2008