SACRAMENTO STATE

Course Change Proposal
Form A

Academic Group (*College*):	Academic Organization (*Department*):	Date:
Engineering & Computer Science	**Electrical & Electronic Engineering**	**10/6/2008**
Type of Course Proposal: **New ___ Change _X_ 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 _X__ No ___	**For Catalog Copy: Yes _X__ No ___** **CCE (*Extension*): Yes ___ No ___**	**Semester Effective:** **Fall ___ Spring _X_, 2009__**

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

Change from:

Subject Area *(prefix)* & Catalog Nbr *(course no.)*:	Title:	Units:
EEE 180	**Signals and Systems**	**3**

Change to:

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

JUSTIFICATION:

Prerequisite change only. From EEE 117 to EEE 117; may be taken concurrently. There will be no change to the course description or content. Previously, the EEE Department viewed EEE 180 too narrowly as part of its sequence of circuits/network courses (hence requiring EEE 180 after Engr 17 and EEE 117). In its review in preparation for ABET, the Department recognized that the proper view is that EEE 180 is to establish a broad foundation of engineering math for applications in communications, control, and digital signal processing, as well as circuit/network analysis. Examples of applications to circuits/networks can be drawn from Engr 17 and also from EEE 117 when taken concurrently with EEE 180.

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

Note:	
Prerequisite: EEE117; may be taken concurrently **Enforced at Registration: Yes_X_ No___**	
Corequisite: **Enforced at Registration: Yes__ No_X_**	
CAN (California Articulation Number):	
Graded: Letter __X___ Credit/No Credit____	**Instructor Approval Required? Yes___ No_X__**
Course Classification *(e.g., lecture, lab, seminar, discussion)*: **C04**	**Title for CMS (not more than 30 characters)** **Signals and Systems**
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

**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: Susan Kiddoo	10/30/2008
College Dean or Associate Dean: John Valentine	11/12/08
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 180 SIGNALS AND SYSTEMS

Required Course

2008 – 2010 Catalog Data: EEE 180. Signals and Systems. Rigorous development of the fundamental relationships governing time-domain and frequency-domain analysis of linear continuous-time and discrete-time systems. Topics include Fourier, Laplace, and z-transforms, sampling theorem, modulation, system stability, and digital filters. Prerequisite: EEE 117; EEE 117 may be taken concurrently. 3 units.

Text: Lathi, B. P., Signal Processing and Linear Systems, Carmichael, CA: Berkeley-Cambridge Press, 1998 (ISBN 0-941413-35-7)

Course Objectives:

1. Integrate basic concepts of signal analysis and linear system theory.
2. Introduce time-domain and transform-domain techniques for describing signals and linear systems and for determining the effects of such systems on signals.
3. Introduce the theory and analysis of both continuous-time and discrete-time signals and systems and to show their relationship.
4. Introduce the student to computer tools (MATLAB) to plot signals and system characteristics and to analyze the effects of systems on signals.

Prerequisites by Topic:

1. Complex number and elementary matrix algebra.
2. Calculus through differential equations.
3. Simple electric circuit analysis.
4. Introduction to transform techniques.

Topics Covered/Class Schedule/Evaluation:

1. Introduction to signals and systems.
2. Continuous-time systems: time-domain analysis.
3. Discrete-time systems: time-domain analysis.
4. Continuous-time systems: Laplace transform analysis.
5. Discrete-time systems: z-transform analysis.
6. Continuous-time signal analysis: Fourier series and Fourier transform.
7. Frequency response of linear, time-invariant, continuous-time systems.
8. Sampling.

Course Outline:

Week	*Topic*	*Text Pages*	*Homework (H), Quiz (Q)*
1	Introduction. Background.	1 – 50	H
2	Introduction to continuous-time signals and systems.	51 – 96	H, Q
3	Introduction to discrete-time signals and systems.	540 – 569	H, Q
4	Continuous-time systems: time-domain analysis.	104 – 165	H, Q
5	Continuous-time time-domain analysis (cont.).		H, Q
6	Discrete-time systems: time-domain analysis.	573 – 611	H, Q

7	Discrete-time time-domain analysis (cont.).		H, Q
8	Continuous-time systems: Laplace transform analysis.	361 – 426	H, Q
9	Laplace transform analysis (cont.).		H, Q
10	Discrete-time systems: z-transform analysis.	668 – 697	H, Q
11	Z-transform analysis (cont.).		H, Q
12	Continuous-time signal analysis. Fourier series.	171 – 226	H, Q
13	Continuous-time signal analysis. Fourier transform.	235 – 309	H, Q
14	Frequency response.	471 – 476	H, Q
15	Sampling.	319 – 330	H,
16	Comprehensive Final Exam		

Evaluation

Weekly quizzes -- Total weight: 50% or 75% of grade (whichever gives the student the highest grade).
(Note: Weekly quizzes are "open book" problems similar to those assigned as homework. Each class period, one or two students are asked to do and explain a homework problem at the board. The grade for this oral presentation is weighted the same as that for a weekly quiz.
Comprehensive final exam -- Weight: 50% or 25% of grade (whichever gives the student the highest grade).

Contribution of Course to Meeting the Professional Component:

- Solution of differential and difference equations.
- Characterization of signals and linear systems; effects of systems on signals.
- Science and Design Content Distribution: Basic Science – 1units or 33%; Engineering Science – 2 unit or 67%.

Relationship of Course to Program Outcomes:

- #1. Knowledge of mathematics: This course strengthens and extends the techniques for solving differential equations learned in mathematics.
- #3. Problem solving: In this course, students learn to use trigonometry, calculus, and time-domain/frequency-domain transform techniques to characterize signals and linear, time-invariant systems and to analyze the effects of systems on signals.
- #4. Knowledge of core EEE topics: This course provides students with a comprehensive overview of signal and system tools that are necessary for analysis and design throughout the EEE core areas.
- #12. Oral communication: This course provides students with opportunities to make oral presentations of solutions to homework problems.

Course Coordinator: Warren D. Smith, EEE **Date:** May 15, 2003

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