COURSE MODIFICATION PROPOSAL

College: [CECS] **Department: [ECE]**

1. **Current Catalog Entry Information:**
   Subject Abbreviation and Number: **[ECE 240]**
   Course Title: **[** Electrical Engineering Fundamentals **]**
   Units: **[3]** units
   General Education Section **[ ] (if applicable)**

2. **Date of Proposed Implementation: (Semester/Year): [Fall] / [2013]** *Comments*

3. **Course Level:**
   [☒]Undergraduate Only **[☐]**Graduate Only **[☐]**Graduate/Undergraduate

4. **Nature of Request:**
   [☐] Delete Course *(Note: Record of course will remain in inactive course file)*

   [☐] Change unit value from **[ ]** units to **[ ]** units

   [☐] Change course type (classification) such as lecture-discussion, laboratory, activity, etc.:
   From: [ ] units @ **[ ] [ ] to [ ]** units @ **[ ] [ ]**
   From: [ ] units @ **[ ] [ ] to [ ]** units @ **[ ] [ ]**

   [☐] Change course title to: **[ ]**

   [☐] Change course abbreviation "Short title" (Maximum of 17 characters and spaces) to
   NEW Short Title: **[• • • • • • • • • • • • • • • • •]**

   [☐] Change current catalog course description *(Attach current and proposed catalog course description)*
   Notes: If grading is NC/CR only, please state in course description. If a course numbered less than 500 is available for graduate credit, please state "Available for graduate credit in the catalog description."

   [☐] Change subject abbreviation number to: *(Example: HSCI 100 to PT 105)* **[ ]**

   [☒] Change requisites *(Prerequisites, Corequisites, Preparatory, Recommended Corequisites)*

   From: [Prerequisite: PHYSICS 220B/L and Math 250. Recommended Co-requisite: ECE 240L and MATH 280.]
   To: [Prerequisite: PHYSICS 220B/L and Math 250. Co-requisite: Math 280 or ECE 280. Recommended Co-requisite: ECE 240L.]

   [☐] Change Current Basis of Grading
   From: [☐]Credit/No Credit Only [☐]Letter Grade Only [☐]CR/NC or Letter Grade

   To: [☐]Credit/No Credit Only [☐]Letter Grade Only [☐]CR/NC or Letter Grade

   [☐] Add course to GE Section **[ ]**

[ ] Remove course from GE Section [ ]

[ ] Change course from GE section [ ] to GE section [ ]

[ ] Change course to a Community Service Learning course (CS)

[ ] Allow multiple enrollments within a semester.

[ ] Change number of times this course may be taken:
May be taken for credit for a total of [ ] times, or for a maximum of [ ] units

[ ] Multiple enrollments are allowed within a semester

[ ] Crosslist this course with [ ]

[ ] Other: [ ]

5. **Justification and Clarification of Request** *(Attach)*

6. **Estimated Impact on Resources within the Department, for other Departments and the University.***(Attach)*

(See Resource List)

7. **Impact on other Departments' programs** *(Attach)*

8. **Indicate which of the Program's Measurable Student Learning Outcomes are addressed in this course.** *(Attach)*

(see Course Alignment Matrix and the Course Objectives Chart)

9. **If this is a General Education course, indicate how the General Education Measurable Student Learning Outcomes (from the appropriate section) are addressed in this course.** *(Attach)*

10. **Methods of Assessment for Measurable Student Learning Outcomes** *(Attach)*
    A. Assessment tools
    B. Describe the procedure dept/program will use to ensure the faculty teaching the course will be involved in the assessment process (refer to the university's policy on assessment.)

11. **Record of Consultation:** *(Normally all consultation should be with a department chair or program coordinator.) If more space is needed attach statement and supporting memoranda.*

Date:	Dept/College:	Department Chair/Program Coordinator	Concur (Y/N)
[2/23/12]	[ECE/CECS]	[Dept. Vote: Ali Amini]	[Y]
[3/16/12]	[ME/CECS]	[Hamid Johari]	[Y]
[3/16/12]	[CS/CECS]	[Steven Stepanek]	[Y]
[3/16/12]	[MSEM/CECS]	[Ileana Costea]	[Y]
[3/16/12]	[CEAM/CECS]	[Nazaret Dermendjian]	[Y]
[ ]	[ ]	[ ]	[IP]

Consultation with the Oviatt Library is **recommended** for course modifications to ensure the

availability of appropriate resources to support proposed course curriculum.

Collection Development Coordinator, Mary Woodley **Date**
Please send an email to: collection.development@csun.edu **[3/9/12]**

12. Approvals:

Department Chair/Program Coordinator:	Date:	[ ]
College (Dean or Associate Dean):	Date:	[ ]
Educational Policies Committee:	Date:	[ ]
Graduate Studies Committee:	Date:	[ ]
Provost:	Date:	[ ]

ATTACHMENT

Current Course Descriptions For ECE 240 With The Proposed New Prerequisites/Co-requites:

ECE 240 Electrical Engineering Fundamentals (3)
Prerequisite: PHYSICS 220B/L and Math 250. Co-requisite: MATH 280 or ECE 280. Recommended Co-requisite: ECE240L.
Introduction to the theory and analysis of electrical circuits; basic circuit elements including the operational amplifier; circuit theorems; dc circuits; forced and natural responses of simple circuits; sinusoidal steady state analysis and the use of a standard computer aided circuit analysis program. Consideration will be given to power, energy, impedance, phasors, frequency response and their use in circuit design.

5. Justification and Clarification of Request
The transient analysis covered in this course requires the basic knowledge of differential equations. That is why it is important for the students taking ECE 240 to have had Math 280 or equivalent (Differential Equations) or be taking it at the same time as this course.

6. Estimated Impact on Resources within the Department, for other Departments and the University.
There will be no impact of resources within the Department, for other Departments and the University.

7. Impact on other Departments' programs
There will be no impact on other Departments' programs

8. Indicate which of the Program's Measurable Student Learning Outcomes are addressed in this course.
Please see the course syllabus attached.

Course Syllabus

ECE 240 – Electrical Engineering Fundamentals

Department:	Electrical and Computer Engineering
Course Number:	ECE 240
Course Title:	Electrical Engineering Fundamentals
Credit Units:	3
Design Units:	2.0

Course Description
Introduction to the theory and analysis of electrical circuits; basic circuit elements including the operational amplifier; circuit theorems; dc circuits; forced and natural responses of simple circuits; sinusoidal steady state analysis and the use of a standard computer-aided circuit analysis program. Consideration is given to power, energy, impedance, phasors, frequency response and their use in circuit design. Three hours lecture per week.

Prerequisites by Topic
Students should have completed differential, integral, and solid analytic geometry, partial differentiation, and multiple integrals with applications (MATH150A, MATH150B, and MATH250). Also required is a completion of PHYS220B/L with coverage of electric and magnetic fields, circuit theory and electromagnetic induction. Students must be taking differential equations (Math 280 or ECE 280) with this course or must have completed it. It is also recommended that students take the lab associated with this course (ECE 240L) at the same time.

Text, References and Software
Svoboda JA, Dorf RC: Introduction to Electric Circuits, John Wiley & Sons, 8th edition, 2010, ISBN: 978-0-470-52157-1
PSPICE, by Cadence Corporation: http://www.cadence.com/

Software:
PSPICE, by OrCAD Corporation (see Internet Resources below);

Internet Resources:
http://www.wiley.com/
http://www.cadence.com/ (for downloading PSPICE)

Learning Outcomes for the Course – After completing this course the students should be able to:

1. Solve D.C. circuit problems with independent and dependent sources, op-amps and resistors using nodal analysis, mesh analysis, superposition, source transformations and Thevenin/Norton equivalent circuits.
2. Find the complete response for first and second-order circuits to input signals modeled by waveforms that are dc, step, window, ramp, decaying exponential, and sinusoidal.
3. Apply phasors and the concept of impedance to analyze circuits with sinusoidal input under steady-state conditions and to find the frequency response of linear, time-invariant circuits.
4. Design simple first and second-order filters given specifications in terms of 3-dB bandwidth and center frequency.

5. Use PSPICE for the design and analysis of elementary circuits as indicated in learning outcomes 1-4.

Topics Covered/Course Outline

- Basic Definitions and Ohm's Law
- KVL, KCL, Current Division and Voltage Division
- Nodal Analysis and Mesh Analysis
- Circuit Theorems (Superposition, Thevenin, Norton)
- Operational Amplifiers
- Capacitors and Inductors
- First-Order Circuits
- Second-Order Circuits
- Phasors and Steady-state Sinusoidal Analysis
- Filters and Frequency Response

Homework, Quizzes, and Examinations

Contribution to Professional Component

Engineering Science:	2.75
Engineering Design	0.25

Relationship to Program Outcomes

This course supports the achievement of the following outcomes:

a. An ability to apply knowledge of math, science, and engineering to the analysis of electrical and computer engineering problems.

c. An ability to design systems which include hardware and/or software components within realistic constraints such as cost, manufacturability, safety and environmental concerns.

e. An ability to identify, formulate, and solve electrical and computer engineering problems.

i. A recognition of the need for and an ability to engage in life-long learning.

k. An ability to use modern engineering techniques for analysis and design.

m. An ability to analyze and design complex devices and/or systems containing hardware and/or software components.

n. Knowledge of math including differential equations, linear algebra, complex variables and discrete math.

Prepared by:

Benjamin F. Mallard, November 2011