CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

ETE 103

COURSE OUTLINE

Course Information		**ABET Unit Classification** (4 Quarter Units)	
Department:	ETE	Math:	MAT 106
Course Number:	ETE 103/L	Basic Science:	
Course Title:	A-C Circuit Analysis / Laboratory	Engineering Topics:	4
Revision Date:	02/20/05	*Contains significant design content:*	No
Revised by:	Thomas Thoen	Other:	
Compliant:	Catalog 2004/05	Curriculum Designation:	Required

I. Catalog Description

ETE 103 A-C Circuit Analysis / Laboratory (4)

Principles of inductance / magnetism; transients in RL circuits. Phasor analysis in AC circuits; basic AC circuit theorems; transformers. 3 lectures/problem-solving. 1 three-hour laboratory

II. Prerequisites and Corequisites

Minimum grade of C- in ETE 102, MAT 106 or equivalent.

III. Textbook and/or other Required Material

Boylestad, Introductory Circuit Analysis, Prentice Hall, 10th ed., 2003.
http://vig.prenhall.com/catalog/academic/product/0,1144,013097417X,00.html

IV. Course Objectives

1. Solve Problems involving RC and RL Transients.
2. Perform AC network analysis on circuits to determine current, voltage, phase and power.
3. Use computer simulation tools to solve AC circuit problems.
4. Understand concepts of AC power and the application of transformers.
5. Perform experiments to validate lecture topics.
6. Compose professional and accurate laboratory reports

V. Expanded Course Description

A. Expanded description of the course

1. Voltage and current relationships in RC and RL transients in switched circuits.
2. Sinusoidal AC voltage measurement, including voltage and current, phase/time/frequency relationships, peak, average and effective values
3. Complex numbers, polar-rectangular forms and conversions, phasors.
4. Single Phase AC network solutions. Applied use of phasors to determine voltage, current, impedance and phase for circuit analysis.
5. AC power. Average power, the power triangle, and power factor
6. Transformers. Mutual inductance, dot convention, primary and secondary voltage and current, reflected impedance.

B. Typical Laboratory Experiments

1. Familiarization with oscilloscopes.
2. Transients in RC and RL circuits.
3. Average, Peak, and Effective value relationships in AC waveforms.
4. AC current and voltage relationships in RC and RL series and parallel circuits.
5. Nodal and Superposition Theorems in AC circuits.
6. Power and Power Factor relationships.
7. Maximum Power Transfer Theorem.
8. Transformer Fundamental relationships.

VI. Class/Laboratory Schedule

3 sessions per week: Two 75-minute lectures and problem discussions. One 2 Hour 50 minute laboratory.

VII. Contribution of Course to Professional Component

Students learn to analyze AC networks with applied scientific principles. Students develop an understanding of the function of resistors, inductors, and capacitors in a functioning circuit. Students learn to conduct an experiment using modern tools, collect data, analyze data, and write a report to professional standards. Students are required to perform computer analysis using modern software tools to validate calculations and experimental results.

VIII. Evaluation of Students

The instructor evaluates outcomes using the following methods:

- Homework assignment submittals
- Examinations
- One-on-one discussions during office hours

The student grades are typically based on the following factors:
quizzes, homework, midterm exams, lab assignments, final Exam

IX. Relationship of Course to Program Outcomes

Crse Obj	Program Outcomes										
	(a) **Use of modern tools of discipl**	***(b)*** **Use of math, science, Engg & Tech**	***(c)*** **Do experi -ments**	***(d)*** **Dsn of sys & compo nents**	***(e)*** **Work on teams**	***(f)*** **Do Tech probs**	***(g)*** **Eff Com**	***(h)*** **Life-long learn**	***(i)*** **Prof, ethics, social resps**	***(j)*** **Prof, soc, globl, diversity**	***(k)*** **Qual, Cont impr, timeli ness**
1		X				X					
2		X				X					
3	X	X				X					
4		X				X					
5	X	X	X		X	X					
6	X				X		X				