EECS 163L POWER SYSTEMS LABORATORY
(Elective for EE)

Catalog Data: **EECS 163L Power Systems Laboratory (Credit Units: 1)** Experiments and field trips relevant to studies in power systems. Corequisite: EECS163. Formerly ECE163L. (Design units: 0)

Textbook: Glover, J. D. and Sarma, M., *Power Systems Analysis and Design,* Thomson Learning.

References: *Standard Handbook for Electrical Engineers.*

Coordinator: Keyue M. Smedley

Course Objectives: Understand the principle of the electrical power generation and distribution system. Understand power flow of single and three phase systems capable of fault calculation and network protection. Understand power system dynamics.

Course Outcomes: Students will:
Describe the principle of the electrical power generation and distribution system.
Calculate the power flow of single and three phase systems.
Perform fault calculation and network protection.
Do dynamic stability analysis.

Prerequisites By Topic: AC circuit theory. Facility in using a computer language and familiarity with UCI computers.

Lecture Topics: Power readings
3 phase circuits with balanced or unbalanced loads
3 phase transformer circuits testing for Y & Δ.
Power transformer, solving with Open Ckt Test and Short Ckt test
Autotransformer

Class Schedule: Meets for 3 hours of lab each week for 10 weeks.

Computer Usage: Use of program package furnished with the text (9 programs)
Write special purpose programs.

Laboratory Projects: Students will use a watt meter, volt meter, amp meter and transformers for the following projects:
Power readings
3 phase circuits with balanced or unbalanced loads
3 phase transformer circuits testing for Y & Δ
Power transformer, solving with Open Ckt Test and Short Ckt test
Autotransformer

Professional Component: Contributes toward the Electrical Engineering Topics Courses.

Relationship to Program Outcomes: This course relates to Program Outcomes a, b, d, e, g, I and k as stated at:
http://undergraduate.eng.uci.edu/degreeprograms/electrical/mission

Design Content Description

Approach: Students use the circuit theory and magnetic theory to analyze the power system. Students gain hands on experiments measuring the power system parameters.
Lectures: 0%
Laboratory Portion: 100%

Grading Criteria:

Laboratory experiments and reports:	90%
Laboratory participation:	10%
	100%

Estimated ABET Category Content:

Mathematics and Basic Science: 0 credit units or 0%
Engineering Science: 1 credit units or 100%
Engineering Design: 0 credit units or 0%

Prepared by: Keyue M. Smedley **Date:** July 2007

CEP Approved: Fall 2004