ECE 2772 – Electrical Engineering Laboratory I  
Spring 1999

**1997-1999 Catalog Data:**  
ECE 2772: Electrical Engineering Laboratory I. Prerequisite: Engineering 2613 or enrollment in Engineering 2613 or permission. Principles of instrumentation and data analysis and the development of methods of experimental analysis for testing theories and hypotheses.

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Engineering 2613 or enrollment in Engineering 2613 or permission.

**Textbooks:**  

**References:**  
Classroom handouts on oscilloscope operation and phase shift measurement

**Course Objectives:**  
This is the first hands on experience in the syllabus of all students in the School of Electrical and Computer Engineering. The first objective is to develop a familiarity with basic electrical engineering laboratory instrumentation including digital and analog multimeters, DC power supplies, function generators, frequency counters and the oscilloscope. The second objective is to reinforce the principles of basic electrical science by building circuits illustrating these principles. Experiments are organized into two major groups, with DC methods occurring first, and AC concepts second.

**Coordinator:**  
Dr. Ronald J. LaSpisa, Visiting Associate Professor, School of Electrical and Computer Engineering

**Topics:**

1. Intro and Exp. 1 & 2  
   Components, Quantities and Units
2. Experiments 15 & 16  
   Introduction to Alternating Current and Voltage
3. Experiments 17, 3 & 4  
   Voltage, Current and Resistance in DC Circuits
4. Experiments 5 & 6  
   Ohm’s Law, Energy and Power
5. Experiments 7, 8, 9 & 10  
   Series Circuits, Parallel Circuits
6. Review, Exp. 11 & 12  
   Series-Parallel Circuits
7. MIDTERM EXAMINATION
8. Experiments 13 & 14  
   Magnetism and Electromagnetism
9. Handout Experiments  
   Phase Shift Measurements
10. Spring Break
11. Experiments 18 & 19  
    Capacitors
12. Experiments 20, 21 & 22  
    Inductors, Transformers
13. Experiments 23 & 24  
    RC Circuits
14. Experiments 25 & 26  
    RL Circuits
15. Experiments 27 & 29  
    RLC Circuits and Resonance
16. FINAL EXAMINATION

**Schedule:**  
One 4 hour session per week, consisting of a one hour lecture plus three hours lab work.

**Computer Usage:**  
None in Spring 99. In Fall 99, there will be three circuit simulation exercises.

**Design Projects:**  
None.
Laboratory Experiments: In chronological order, with workbook experiment number:

1. Metric Prefixes, Scientific Notation, Graphing
2. Laboratory Meters, Power Supply
15. Oscilloscope
16. Sine Wave Measurements
17. Pulse Measurements
3. Measurement of Resistance
4. Voltage Measurement, Circuit Ground
5. Ohm's Law
6. Power in DC Circuits
7. Series Circuits
8. Voltage Divider
9. Parallel Circuits
10. Series - Parallel Combination Circuits
11. Superposition Theorem
12. Thevenin's Theorem
13. Wheatstone Bridge
14. Magnetic Devices
   Work on Phase Shift Measurement
18. Capacitors
19. Capacitive Reactance
20. Inductors
21. Inductive Reactance
22. Transformers
23. Series RC Circuits
24. Parallel RC Circuits
25. Series RL Circuits
26. Parallel RL Circuits
27. Series Resonance
29. Passive Filters

Written and Oral Communications: Short written summaries and conclusions in lab turn-ins.
Limited oral responses during lectures and review periods.

Teamwork: Student perform laboratory work in groups of two. Homework done individually.

Assessment methods used:

1. Graded homework and lab reports
2. Midterm and final exams

Contribution to Professional Component: Engineering Science - 2 credit hours

Program Objectives & Related Strategy and Actions:

2: iii
3: iii
5: ii

ABET 2000 Criterion 3 Contents: b, f, k

Prepared by: Ronald J. LaSpisa; Date: May 1, 1999