

**ELEC 70AL Course Outline as of Spring 2010****CATALOG INFORMATION**

Dept and Nbr: ELEC 70AL Title: DC AND ELEC CONST LAB

Full Title: Direct Current and Electronic Construction Lab

Last Reviewed: 5/5/2008

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.00	17.5	Lecture Scheduled	17.50
Minimum	2.00	Lab Scheduled	2.00	17.5	Lab Scheduled	35.00
		Contact DHR	1.00		Contact DHR	17.50
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 35.00

Total Student Learning Hours: 105.00

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Measurement and analysis of DC circuits. Documentation of results in a lab report format. Basic electronic fabrication including general safety rules, soldering and de-soldering a variety of terminal posts and printed circuit boards, coaxial, and shielded pair cable assembly, and schematic reading.

**Prerequisites/Corequisites:**

Course Completion or Current Enrollment in ELEC 70A

**Recommended Preparation:****Limits on Enrollment:****Schedule of Classes Information:**

Description: Measurement and analysis of DC circuits. Documentation of results in a lab report format. Basic electronic fabrication including general safety rules, soldering and de-soldering a variety of terminal posts and printed circuit boards, coaxial, and shielded pair cable assembly, and schematic reading. (Grade Only)

Prerequisites/Corequisites: Course Completion or Current Enrollment in ELEC 70A

Recommended:

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Effective:	Inactive:
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<b>UC Transfer:</b>	Effective:	Inactive:
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**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

1. Measure resistance using a Vacuum Tube Voltmeter (VTVM) or Digital Voltmeter (DVM).
2. Connect circuits following a schematic diagram.
3. Measure current through different parts of an electrical circuit using an ammeter.
4. Measure voltage across different points in an electrical circuit using a voltmeter.
5. Document lab results using data tables, schematics, and graphs as appropriate.
6. Evaluate lab results through written observations.
7. Pass an electrical safety exam with a grade of 80% or better.
8. Tin stranded wires and splice wires by various acceptable techniques.
9. Construct a twisted shielded pair cable and a coaxial cable.
10. Identify and interpret graphic symbols of common electrical components.

### **Topics and Scope:**

- I. Resistance measurement (VTVM and DVM)
- II. Circuit connections
  - A. Following a schematic diagram
- III. Electrical circuit measurements
  - A. Meter reading
  - B. Voltage, using a voltmeter
  - C. Current, using an ammeter
- IV. Meter connections (in circuit)
- V. Comparison of theoretical versus measured results
- VI. Electrical safety
  - A. Avoiding electrical shock
  - B. Proper use of test equipment
  - C. General first aid techniques
- VII. Electronic hand tools

- A. Basic concepts
  - 1. proper use
  - 2. maintenance
  - 3. safety
- B. Hand tools
  - 1. soldering iron
  - 2. microscope
  - 3. de-soldering tools
  - 4. wire cutter
  - 5. pliers
  - 6. routing tools
- VIII. Soldering techniques
  - A. Tinning
  - B. Splicing
  - C. Solder feeding
- IX. Connecting wires and components to terminals and boards
- X. Coaxial and shielded pair cable assembly
- XI. Identification of electronic symbols on schematic drawings

### **Assignment:**

#### Lab reports

- 1. Resistance measurements
- 2. Ohm's law
- 3. Series circuit
- 4. Parallel circuits
- 5. Series-parallel circuits
- 6. Internal resistance
- 7. Maximum power transfer

#### Hands-on test (skill demonstration)

Proper use of equipment to verify Kirchhoff's law

#### Construction projects

- 1. Safety exam
- 2. Soldering wire terminations
- 3. Connecting wire and component leads to terminal strips
- 4. Coaxial and shielded pair cable assembly
- 5. Printed-Circuit board assembly techniques
- 6. Reading schematic diagrams

Reading: approximately 35 pages per week in text

### **Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab reports
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Writing 30 - 70%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

None

Problem solving  
0 - 0%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Basic electronic construction techniques of a construction project, performance exam

Skill Demonstrations  
10 - 50%

**Exams:** All forms of formal testing, other than skill performance exams.

None

Exams  
0 - 0%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Class participation

Other Category  
5 - 20%

### **Representative Textbooks and Materials:**

David Buchla. Experiments in Electronics Fundamentals and Electric Circuits Fundamentals, 8th edition, Prentice Hall, 2008