

**CONS 181 Course Outline as of Fall 2011****CATALOG INFORMATION**

Dept and Nbr: CONS 181 Title: RESIDENTIAL ELECT WIRING

Full Title: Residential Electrical Wiring

Last Reviewed: 1/31/2011

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.50	17.5	Lecture Scheduled	26.25
Minimum	2.00	Lab Scheduled	1.50	8	Lab Scheduled	26.25
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 52.50

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:**

Electrical systems design, layout, and installation. Focus is on residential electrical system design and wiring from the electrical service entrance through branch circuit fixtures and loads. California Electric Code (CEC) and International Residential Code requirements for safe, code-compliant installations.

**Prerequisites/Corequisites:****Recommended Preparation:**

Course Completion of MATH 151 or MATH 150B

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

Description: Electrical systems design, layout, and installation. Focus is on residential electrical system design and wiring from the electrical service entrance through branch circuit fixtures and loads. California Electric Code (CEC) and International Residential Code requirements for safe, code-compliant installations. (Grade Only)

Prerequisites/Corequisites:

Recommended: Course Completion of MATH 151 or MATH 150B

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:**

Not Certificate/Major Applicable

## **COURSE CONTENT**

### **Outcomes and Objectives:**

1. Outline the history of modern electricity and its use.
2. Apply the California Electric Code (CEC) to residential wiring projects.
3. Explain electrical grounding requirements.
4. Calculate wire ampacity for specific loads and conditions of use.
5. Install conduit and pull wires for electrical branch circuits.
6. Explain direct current (DC) and alternating current (AC) electricity and its use.
7. Describe typical commercial use of three-phase power.

### **Topics and Scope:**

- I. History of electricity
  - A. Westinghouse vs. Edison
  - B. Power generation and transmission
  - C. California Electric Code development
- II. Electricity
  - A. Voltage, current, resistance
  - B. Ohm's law
  - C. Power vs. energy
  - D. Series and parallel circuits
  - E. AC & DC
- III. Electrical safety & tools
  - A. Electricity and bodily effects
  - B. Multimeters & safe meter usage
  - C. Tools of the trade
- IV. The residential electrical service
  - A. Supply transformers
  - B. Service entrance

- C. System design and layout
- D. Energy efficiency
- V. Branch circuits
  - A. Code requirements
  - B. Loads -- connected, calculated, demand
  - C. Lighting and receptacles
  - D. Conduit runs and installation
  - E. Wiring types and sizing
- VI. Grounding and grounding systems
  - A. Purpose of grounding
  - B. Types of grounding systems
  - C. Code requirements, sizing
- VII. Three-phase power
  - A. High voltage distribution and application
  - B. Industrial safety

**Laboratory Topics to Include:**

- Electrical systems design & layout
- Conduit and wiring installation
- Calculations for loads and conditions
- Grounding systems

**Assignment:**

1. Read approximately one textbook chapter per week
2. Weekly worksheets & problems (in class and homework)
3. Lab activities
4. 5-10 quizzes
5. Mid-term
6. Wiring design project
7. Final exam

**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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, worksheets, lab activities, wiring design project

Problem solving  
30 - 60%

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

None

Skill Demonstrations  
0 - 0%

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

Quizzes, midterm, final

Exams  
30 - 60%

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

Attendance and participation

Other Category  
5 - 10%

**Representative Textbooks and Materials:**

2010 California Electrical Code, Title 24, Part 3. State of California.

Practical Electrical Wiring: Residential, Farm, Commercial, and Industrial: Based on the 2008 National Electrical Code. Author: Richter, Herbert. Published by: Park Publishing, Inc., New Richmond, WI, 2008