

**Course Outline**

**COURSE:** CARP 217      **DIVISION:** 50      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Fall 2016      **Inactive Course**

**SHORT TITLE:** INTRO TO WELDING AND CUTTING

**LONG TITLE:** Introduction to Welding and Cutting

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
1	1	Lecture:	6	6
		Lab:	30	30
		Other:	0	0
		Total:	36	36

**COURSE DESCRIPTION:**

This course covers welding methods, brazing, flame cutting, and shielded arc welding. Topics include thermo forming and thermo setting plastics applicable to the building construction industry. Perform basic welding tasks in a safe manner.

**PREREQUISITES:**

**COREQUISITES:**

**CREDIT STATUS:** C - Credit - Degree Non Applicable

**GRADING MODES**

L - Standard Letter Grade

**REPEATABILITY:** N - Course may not be repeated

**SCHEDULE TYPES:**

02 - Lecture and/or discussion

03 - Lecture/Laboratory

04 - Laboratory/Studio/Activity

**STUDENT LEARNING OUTCOMES:**

1. The students in this class will be able to weld heavy plate metal together in a safe manner.

Measure: Class Performance, Performance Exams

PLO: 1

ILO: 3, 7

GE-LO:

Year assessed or anticipated year of assessment: 2012-13

2. The students in this class will be able to set up a welding machine and weld using proper techniques.

Measure: Quizzes, Written Exams,

PLO: 1

ILO: 3, 7

GE-LO:

Year assessed or anticipated year of assessment: 2012-13

#### PROGRAM LEARNING OUTCOMES:

1. Demonstrate journey level skills, including those skills necessary to build all concrete infrastructures that comprise the California transportation system.
2. Locate on the blueprints and in the specifications, the information needed to construct various types of structures and assemble its various components.
3. Perform horizontal layout and vertical layout of wood framed wall components. Install interior and exterior trims and moldings. Construct various types of roofs and stairs.

#### CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Inactive Course: 11/28/2016

Out-of class assignments: For each topic, the student will read chapters and do homework assignments at the end of those chapters.

2 lec/10 lab

- a. Controls for common hazards
  1. Personal protective equipment
  2. Fire prevention
  3. Welding or cutting on containers or pipes
  4. Toxic substances
  5. Confined space
  6. Training and supervision
- b. Oxyacetylene Cutting
  1. Oxyacetylene equipment
  2. Safety precautions
  3. Equipment setup
  4. Operation of the equipment
    - a. Adjusting the flame
    - b. Testing the flame
    - c. Relighting the torch
    - d. Shutting off the torch
  5. Cutting process
    - a. Supply of fuel
    - b. Selecting the cutting tip
    - c. Cutting of steel
- c. Welding
  - a. Types of welding

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- b. Welding terminology
- c. Safety in welding
  - 1. Eye protection
  - 2. Helmet and goggles
  - 3. Clothing
  - 4. Screens or shields

SLO: The student will demonstrate the safe procedures in assembling and using cutting and welding equipment.

The student will set up, light, and adjust the flame of an oxyacetylene torch. Use the torch to make straight and bevel cuts and to pierce and cut holes in 3/8" mild steel plate.

Assignments: Read the chapters covered in the lecture and do the homework exercises at the end of the chapters. Answer the study guide questions on the assigned subject.

Set up, light, and adjust the flame of an oxyacetylene torch. Use the torch to make straight and bevel cuts and to pierce and cut holes in 3/8" mild steel plate.

Demonstrate the safe procedures in assembling and using cutting and welding equipment.

2 lec/10 lab

- d. Arc welding
  - 1. Electric arc
    - 2. Electric current
    - 3. Arc welding machines
      - 2. DC welders
      - 3. AC welders
    - 4. Electrodes
      - 1. Types of electrodes
      - 2. Polarity
    - 5. Safety precautions
      - a. Radiation
      - b. Toxic fumes
      - c. Electric shock
      - d. Spattering
      - e. Fire
    - 6. Welding techniques
      - a. Preparing the metal
      - b. Striking an arc
      - c. Forming an arc
      - d. Controlling bead formation
      - e. Controlling arc blow
      - f. Regulating current and voltage
    - e. Electrodes for shielded metal arc welding
      - 1. What is an electrode
      - 2. Identifying electrodes
      - 3. Selecting the correct electrode
      - 4. Deposition of electrodes
      - 5. Conserving and storing electrodes
      - 6. Types of mild steel electrodes
        - 7. Iron powder electrodes
        - 8. Low-hydrogen electrodes

SLO: The student will run several parallel stringer beads on light gauge steel in flat, horizontal, and vertical positions using 3/32" Ø E6013 electrodes.

Assignments: Read the chapters covered in the lecture and do the homework exercises at the end of the chapters. Answer the study guide questions on the assigned subject.

Run several parallel stringer beads on light gauge steel in flat, horizontal, and vertical positions using 3/32" Ø E6013 electrodes.

2 lec/10 lab

- f. Flat position welding
  - 1. Joint Design
  - 2. Weld passes
    - a. How to weld a butt joint
    - b. Welding procedure
    - c. Making a single-pass fillet lap weld
    - d. Making a multiple-pass fillet lap weld
    - e. Making a single-pass T-fillet joint
    - f. Making a multiple-pass T-fillet joint
  - g. How to make an outside corner weld
    - g. Horizontal welding
    - A. How to hold the electrode
    - B. Multiple-pass horizontal welds
  - h. Vertical welding
    - 1. Electrode position and movement
    - 2. Downhill welding
    - 3. Uphill welding
    - 4. Multiple-pass vertical welds
  - i. Overhead welding
    - a. Position for overhead welding
    - b. Welding procedure
    - c. Multiple-pass overhead welds

SLO: The student will make one acceptable multiple-pass "T" weld plate in the vertical uphill position, using 1/8" Ø E6013 electrodes. The student will demonstrate the ability to make acceptable vertical uphill fillet welds on 1/4" steel plate.

The student will demonstrate the ability to make acceptable overhead fillet welds on 1/4" steel plate.

Assignments: Read the chapters covered in the lecture and do the homework exercises at the end of the chapters. Answer the study guide questions on the assigned subject.

Make one acceptable multiple-pass "T" weld plate in the vertical uphill position, using 1/8" Ø E6013 electrodes.

Demonstrate the ability to make acceptable vertical uphill fillet welds on 1/4" steel plate.

Demonstrate the ability to make acceptable overhead fillet welds on 1/4" steel plate.

2 Hours

Final exam

#### **METHODS OF INSTRUCTION:**

- A. Lecture and discussion
- B. Visual aids
- C. Demonstrations
- D. Group hands-on exercise
- E. Individual hands-on exercise
- F. One-on-one hands-on instruction

#### **METHODS OF EVALUATION:**

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The types of writing assignments required:

Written homework

Reading reports

Lab reports

Essay exams

The problem-solving assignments required:

Homework problems

Field work

Lab reports

Quizzes

Exams

The types of skill demonstrations required:

Class performance

Field work

Performance exams

The types of objective examinations used in the course:

Multiple choice

True/false

Matching items

Completion

Other category:

None

The basis for assigning students grades in the course:

Writing assignments: 10% - 20%

Problem-solving demonstrations: 10% - 40%

Skill demonstrations: 30% - 70%

Objective examinations: 10% - 20%

Other methods of evaluation: 0% - 0%

### **REPRESENTATIVE TEXTBOOKS:**

Required:

Barclay, CTCNC. Construction Safety Orders 1 & 2, Introduction to Welding and Cutting. Thomas West, CTCNC, 2013. Or other appropriate college level text.

Reading level of text, Grade: 10 Verified by: publisher/dvt

### **ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Not Transferable

UC TRANSFER:

Not Transferable

### **SUPPLEMENTAL DATA:**

Basic Skills: N

Classification: Y

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Noncredit Category: Y  
Cooperative Education:  
Program Status: 1 Program Applicable  
Special Class Status: N  
CAN:  
CAN Sequence:  
CSU Crosswalk Course Department:  
CSU Crosswalk Course Number:  
Prior to College Level: Y  
Non Credit Enhanced Funding: N  
Funding Agency Code: Y  
In-Service: N  
Occupational Course: A  
Maximum Hours:  
Minimum Hours:  
Course Control Number: CCC000500350  
Sports/Physical Education Course: N  
Taxonomy of Program: 095210