

**WELD 175A Course Outline as of Fall 2014****CATALOG INFORMATION**

Dept and Nbr: WELD 175A Title: WELDING TECHNOLOGY 1

Full Title: Welding Technology 1

Last Reviewed: 10/28/2013

Units	Course Hours per Week		Nbr of Weeks		Course Hours Total	
Maximum	6.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	6.00	Lab Scheduled	9.00	17.5	Lab Scheduled	157.50
		Contact DHR	0		Contact DHR	0
		Contact Total	12.00		Contact Total	210.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 315.00

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: WELD 75A

**Catalog Description:**

A study of all aspects of welding processes for welding and related trades. Instruction includes cutting, gouging, welding symbols, TIG (Tungsten Inert Gas), MIG (Metal Inert Gas), and SMAW (Shielded Manual Arc Welding). Preparation for the AWS (American Welding Society) Limited Structural Certification test is included.

**Prerequisites/Corequisites:**

Course Completion of WELD 70

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

Description: A study of all aspects of welding processes for welding and related trades.

Instruction includes cutting, gouging, welding symbols, TIG (Tungsten Inert Gas), MIG (Metal Inert Gas), and SMAW (Shielded Manual Arc Welding). Preparation for the AWS (American Welding Society) Limited Structural Certification test is included. (Grade Only)

Prerequisites/Corequisites: Course Completion of WELD 70

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**

**Student Learning Outcomes:**

Upon completion of the course, students will be able to:

1. Safely use the tools and equipment in a welding shop.
2. Demonstrate the ability to pass the American Welding Society Limited Structural Certification Test.

**Objectives:**

Upon completion of this course, the student will be able to:

1. Safely use tools and operate equipment utilized in the welding trade.
2. Demonstrate an intermediate level of skill in the use of SMAW (Shielded Manual Arc Welding), cutting, and gouging.
3. Complete basic welding projects.
4. Interpret basic blueprints.
5. Demonstrate the skills required to pass a Limited American Welding Society Structural Certification Test (limited to 1/8" - 3/4" steel and flat and horizontal positions.)

**Topics and Scope:**

- I. Safety Issues
- II. Shielded Metal Arc Welding (SMAW)
  - A. Fillet welds, flat and horizontal positions
  - B. Single V-butt joints, flat and horizontal
  - C. Welding cast iron
  - D. Hardfacing
  - E. Identification and uses of welding electrodes
- III. Blueprint Reading
  - A. Print interpretation
  - B. Weld symbols

- IV. Gas Metal Arc (also referred to as MIG)
  - A. Welding ferrous and non-ferrous metals
  - B. Power sources
  - C. Shielding gases
  - D. Wire feeders
  - E. Guns
  - F. Consumable wire
  - G. Metal thicknesses
  - H. Welding various positions
  - I. Manipulative practice
- V. Gas Tungsten Arc Welding (also referred to as TIG)
  - A. Welding ferrous and non-ferrous metals in the flat position
  - B. Power sources
  - C. Torches
  - D. Shielding gases
  - E. Tungsten electrodes
  - F. Metal preparation
  - G. Filler rod
  - H. Manipulative practice
- VI. Air Arc Cutting
  - A. Equipment
  - B. Carbon electrodes
  - C. Machine settings
  - D. Manipulative practice
- VII. Flame Cutting
  - A. Manual
  - B. Automatic
  - C. Machine settings
  - D. Manipulative practice
- VIII. Metal Surfacing
  - A. Wear problems
  - B. Material selection
  - C. Process selection
  - D. Metal spraying
- IX. Plasma Arc Cutting
  - A. Power source
  - B. Torch and nozzles
  - C. Cutting gases
  - D. Ferrous and nonferrous metals
  - E. Cutting techniques
- X. A.W.S. (American Welding Society) Certification Test
  - A. Prepare plates
  - B. Weld (SMAW or MIG)
  - C. Prepare test samples
  - D. Bend coupons
- XI. Fabrication Techniques
  - A. Tacking
  - B. Weld direction
  - C. Shrinkage
  - D. Distortion prevention and control

**Assignment:**

1. Reading: approximately 10-20 pages per week.
2. Complete chapter reviews and homework problems.
3. Notebook of lecture/demonstration notes and handouts.
4. Skill exercises: Weekly welding samples including:
  - a. SMAW in flat and horizontal positions with numerous types of electrodes.
  - b. MIG welding of ferrous and non-ferrous metals of 1/8" - 3/4" thicknesses and in flat and horizontal positions.
  - c. Ferrous and non-ferrous cutting processes.
  - d. TIG welding of ferrous and non-ferrous metals of 1/8" - 3/4" thicknesses.
5. Welding projects (5-10): given a number of pieces of metal and a specific process, fabricate a sample within a specified amount of time.
6. Quizzes (5-10).
7. Final performance skill 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.

Chapter reviews and notebook	Writing 10 - 20%
<b>Problem Solving:</b> Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.	
Homework problems	Problem solving 5 - 10%
<b>Skill Demonstrations:</b> All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
Welding samples; projects; skill exam	Skill Demonstrations 50 - 60%
<b>Exams:</b> All forms of formal testing, other than skill performance exams.	
5-10 quizzes	Exams 10 - 20%
<b>Other:</b> Includes any assessment tools that do not logically fit into the above categories.	
Participation	Other Category 0 - 15%

**Representative Textbooks and Materials:**

Modern Welding Technology. Howard B. Cary. Prentice Hall, 2004. (Seminal book in the field) (classic)  
 Instructor prepared materials.