

WELD 113 Course Outline as of Fall 2024**CATALOG INFORMATION**

Dept and Nbr: WELD 113 Title: THERMAL CUTTING
 Full Title: Thermal Cutting Processes
 Last Reviewed: 3/9/2020

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	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		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 or P/NP

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

Also Listed As:

Formerly:

Catalog Description:

An introduction to the principles of thermal cutting processes. Covers the setup and safe use of Oxy-fuel Cutting (OFC), Plasma Arc Cutting (PAC) and Air Carbon Arc Cutting (CAC-A) equipment

Prerequisites/Corequisites:

Course Completion of WELD 170

Recommended Preparation:

Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) or equivalent; and Course Completion or Concurrent Enrollment in MACH 161

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

Description: An introduction to the principles of thermal cutting processes. Covers the setup and safe use of Oxy-fuel Cutting (OFC), Plasma Arc Cutting (PAC) and Air Carbon Arc Cutting (CAC-A) equipment (Grade or P/NP)

Prerequisites/Corequisites: Course Completion of WELD 170

Recommended: Eligibility for ENGL 100 OR EMLS 100 (formerly ESL 100) or equivalent; and

Topics and Scope:

I. Introduction

- A. Overview and comparison of processes
 - 1. Plasma cutting
 - 2. Oxy-acetylene cutting
 - 3. Air-arc gouging
- B. Tools and equipment
- C. Safety
- D. Speed and quality
- E. Most common industrial applications
- F. Materials appropriate to each process

II. Oxy-acetylene Cutting

- A. Lecture
 - 1. Safety
 - 2. Gases
 - 3. Tanks
 - 4. Torches
 - 5. Accessories
 - 6. Applications
 - 7. Ferrous and non-ferrous metals
- B. Lab
 - 1. Setting up and shutting down equipment
 - 2. Cutting
 - a. Straight line cuts
 - b. Circles
 - c. Bevels
 - d. Changing cutting direction
 - e. Free-form cutting
 - f. Stack cutting

III. Plasma Cutting

- A. Lecture
 - 1. Safety
 - 2. Gases
 - 3. Tanks
 - 4. Torches
 - 5. Accessories
 - 6. Applications
 - 7. Ferrous and non-ferrous metals
 - 8. Stack cutting production methods
- B. Lab
 - 1. Setting up and shutting down equipment
 - 2. Cutting
 - a. Straight line cuts
 - b. Circles
 - c. Bevels
 - d. Changing cutting direction
 - e. Free-form cutting
 - f. Stack cutting

IV. Air-arc Gouging

- A. Lecture
 - 1. Safety

- 2. Gases
- 3. Tanks
- 4. Torches
- 5. Accessories
- 6. Applications
 - a. New fabrications
 - b. Salvage and repair
- 7. Ferrous and non-ferrous metals
- B. Lab
 - 1. Setting up and shutting down equipment
 - 2. Groove cutting
 - 3. Weld removal
 - 4. Full penetration
 - 5. Joint preparation
 - 6. Back gouging
- V. Economics of Processes
 - A. Cost of set-ups
 - B. Production speed
 - C. Purchasing equipment

Assignment:

Assigned projects should supplement the course content

Lecture-Related Assignments:

- 1. Weekly reading assignments, 10-15 pages per week
- 2. Homework
- 3. Quizzes and Exams

Lab-Related Assignments:

- 1. Equipment set-up and shut down
- 2. Cutting projects--samples of each process
- 3. Final project: manipulate a cutting course to result in a given shape

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 skill demonstrations 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

Problem solving
10 - 20%

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

Equipment set up and shut down; cutting projects

Skill Demonstrations
50 - 60%

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

Quizzes, exams, and final project

Exams
10 - 20%

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

Participation

Other Category
0 - 10%

Representative Textbooks and Materials:

Modern Welding. 12th ed. Bowditch, William and Bowditch, Kevin and Bowditch, Mark.

Goodheart-Willcox. 2020

Instructor prepared materials.