

**Western Iowa Tech Community College  
Course Outline of Record**

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Date: 09/24/2015

Prefix & No.: WEL 420 Course Title: Intermediate Pulse Arc GMAW Welding

Semester **Credit** Hours: 4.00

Lecture **Contact** Hours per Semester: 8.00

Lab **Contact** Hours per Semester: 112.00

Clinical **Contact** Hours per Semester: 0.00

OJT or Internship **Contact** Hours per Semester:

Course/Lab Fee:  Yes  No

Pre and Post Assessments: \_\_

**Course Description**

This course combines lecture and lab activities to present the Gas Metal Arc welding (MIG) process used extensively by industry, with a focus on pulse metal transfer. It emphasizes hands-on applications, metal transfer concepts, GMAW equipment, welding procedures, and out of position welding with an emphasis on aluminum and mild steel, as well as safety.

Prerequisite: WEL 424 Intro to Pulse Arc GMAW Welding

Corequisite: None

**Course Needs Statement**

This course was developed through the DAUM process to meet the local industry needs and national accreditation requirements for WITCC welding students.

**Required Textbooks and/or materials**

Yes  No  Other

**Course Objectives:**

The course will provide information which should enable the student to:

1. Safely operate MIG pulse arc welding equipment
2. Identify and use various types of metal transfer
3. Maintain MIG pulse arc welding equipment
4. Select proper filler metals for aluminum and mild steel
5. Select proper shielding gases for aluminum and mild steel
6. Set welding parameters per welding procedures
7. Produce sound welds out-of-position using a MIG pulse arc welder on aluminum and mild steel
8. Demonstrate the skills necessary to obtain certification per the American Welding Society D1.1 welding code

**Content Outline**

- I. Safety in MIG Welding
  - A. Eye protection
  - B. Clothing
  - C. Electrical shock
  - D. Hazardous fumes
- II. Shielding Gases for Aluminum
  - A. Argon
  - B. Helium
  - C. Mixtures
- III. Filler Metals
  - A. Alloy steels
  - B. Aluminum
  - C. Other alloys
- IV. Other Constant Potential Processes
  - A. Submerged Arc Welding
  - B. Eletroslag Welding

**Assessment**

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**Course Competencies**

At the conclusion of the course, the student will be able to:

1. Observe all safety procedures of pulse arc MIG welding
2. Determine the type of filler wire for a given job
3. Set up a pulse arc MIG welding station
4. Adjust machine for pulse arc transfer on aluminum and mild steel
5. Adjust machine for other ferrous and nonferrous metals
6. Diagnose equipment problems
7. Maintain pulse arc MIG welding equipment
8. Produce out-of-position pulse arc MIG welds that meet AWS D1.1 inspection and testing standards

**Addendum**

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**Prefix & No.:** WEL 420 **Course Title:** Intermediate Pulse Arc GMAW Welding

**Key words:**

**Required Textbooks and/or Materials**

Title: Welding Principles and Applications

Author: Jeffus & Johnson

Edition: Current

Publisher: Delmar

ISBN-13:

ISBN-10:

Other Materials: Safety glasses, gloves, pliers, and leathers

**Course/Lab Fee:** \$0.00

**Rationale (usage) for lab fees:**

**Additional Information:**

Competencies According AWS D1.1 Standards

- I. \_\_\_\_ Tee Joint 3/16" 2F Fillet Horizontal **Aluminum**
- II. \_\_\_\_ Lap Joint 3/16" 2F Plate **Aluminum**
- III. \_\_\_\_ V Groove 3/8" 3G Plate Vertical Up mild steel
- IV. \_\_\_\_ V Groove 3/8" 4G Plate Overhead mild steel
- V. \_\_\_\_ V Groove 1" 1G Plate mild steel(unlimited thickness qualification)

**Common Final:**  Yes  No

**See Division Chair for facility and equipment needs.**

**Reminder: Each Course Outline of Record is expected to be reviewed every five (5) years.**

**Attached Files:**

[Competencies According to AWS D1.1 Standards](#)