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## CIMWD-212 Syllabus

### *Pipe Welding – Socket & Flange Welding*

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#### Recommended Textbook:

Welding: Principles and Applications 8<sup>th</sup> Edition

#### Course Description:

Introduces safety protocols and proper weld pipe preparation. Focuses on alignment and pipe welding with socket joints and flange joints.

#### Course Topics

1. Safety.
2. Socket and flange joints.
3. Socket alignment.
4. Flange alignment.
5. Socket welding.
6. Flange welding.

#### Learning Objectives

1. Demonstrate proper safety practices for pipe welding.
2. Identify and explain a socket pipe joint.
3. Identify and explain a flanged pipe joint.
4. Demonstrate the proper alignment techniques for the socket and flanged pipe joints.
5. \*Perform a weld using the proper techniques for the socket and flanged pipe joint using the Shielded Metal Arc Welding process.

#### Competency-Based Education

The Welding Program at Henry Ford College uses a system of learning called Competency-Based Education (CBE). This competency-based welding program is centered on teaching specific job skills required in industry and mastery of these skills.

CBE is a very personalized teaching system that has the following characteristics:

- Ongoing Program
- Open entry - flexible schedule
- Credit granted for work completed
- Evaluation (grades) based on performance
- Fixed content in each course
- Variety of student levels served in each class
- Work at your own pace
- Live or taped lectures and demonstrations





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This competency-based program has several very important benefits for you:

- You will be given a list of the skills and knowledge needed to complete the program successfully.
- Your performance will not be compared to that of other students, but to a fixed standard, which has been set for the program.
- If you have already acquired certain skills required for this program, you may simply demonstrate this and begin focusing your attention on new skills.
- You will be able to review learning materials several times in order to attain the skill or knowledge.
- If you are able to attain the skills easily, you may progress through the program faster than the average person. If you progress through the program faster than average, you can graduate in a shorter time frame.

#### **What's Required of You:**

For this system to work, you will be expected to:

1. Assume the responsibility for your own learning. Your instructor will give you assistance, but the actual responsibility for learning rests with you, the student.
2. Utilize the materials provided for you. The program's resources have been carefully chosen and developed to help you learn.
3. Devote your energy to attaining the skills and knowledge required for your program.

#### **The Instructor's Role:**

The instructors in HFC's Welding Program work with students individually and guide them through the learning process with the help of many different learning resources. In CBE, instructors are often referred to as learning managers because they manage the activities in the program and facilitate the learning process. If you are having difficulty, you should go to your instructor with your problem. The instructor's goal is to find the most effective way to help you learn the tasks in the program.

#### **How your grade is computed in this program:**

If your class is a designated lecture module, your grade will be based off of an exit quiz. When a passing grade is complete, you will be able to move on to the next module.

If this class is a designated lab module, your grade will be based off of a grading matrix. You will evaluate your competencies along with the instructor. You will need a 3-ring binder to keep the finished and signed grading sheets. Those will be turned in when all projects are finished for the module your taking. The final grade will be entered when these are reviewed.





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#### Welding Technology Grading Checklist

Check	Criteria	Points
	Safety (10 points)	
	PPE	
	Equipment in working order	
	Lab rules followed	
	Work areas cleaned and tools returned	
	Welding, Cutting, & Fabrication Set-Up (10 points)	
	Welding machine set correctly	
	Cutting machines set correctly	
	Fabrication machines set correctly	
	Followed Instructions (10 points)	
	Parts cut to correct size	
	Joints assembled correctly	
	Position of weld was correct	
	Correct filler metal was used	
	Visual Inspection of weld (20 points)	
	Bead width	
	Welding angle	
	Arc gap if applicable	
	Porosity	
	Fillet weld size if applicable	
	Groove weld under fill	
	Joint penetration	
	Incomplete fusion	
	Cracks	
	Cold lap	
	Undercut	
	Arc strikes	
	Fillet weld contour if applicable	
	Inclusions	
	Groove weld height (overfill)	





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#### Corrective Action Taken:

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Student: \_\_\_\_\_ Instructor: \_\_\_\_\_

#### Grading Scale:

- A+ = 100-98
- A = 97-93
- A- = 92-90
- B+ = 89-87
- B = 86-83
- B- = 82-80
- C+ = 79-77
- C = 76-73
- C- = 72-70
- D+ = 69-67
- D = 66-63
- D- = 62-60
- E = 59-below

#### Chapter:

5

#### Estimated Time for Projects:

- Project 1: 15 hrs
- Project 2: 15 hrs





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## **CIMWD-212 Syllabus**

### *Pipe Welding – Socket & Flange Welding*

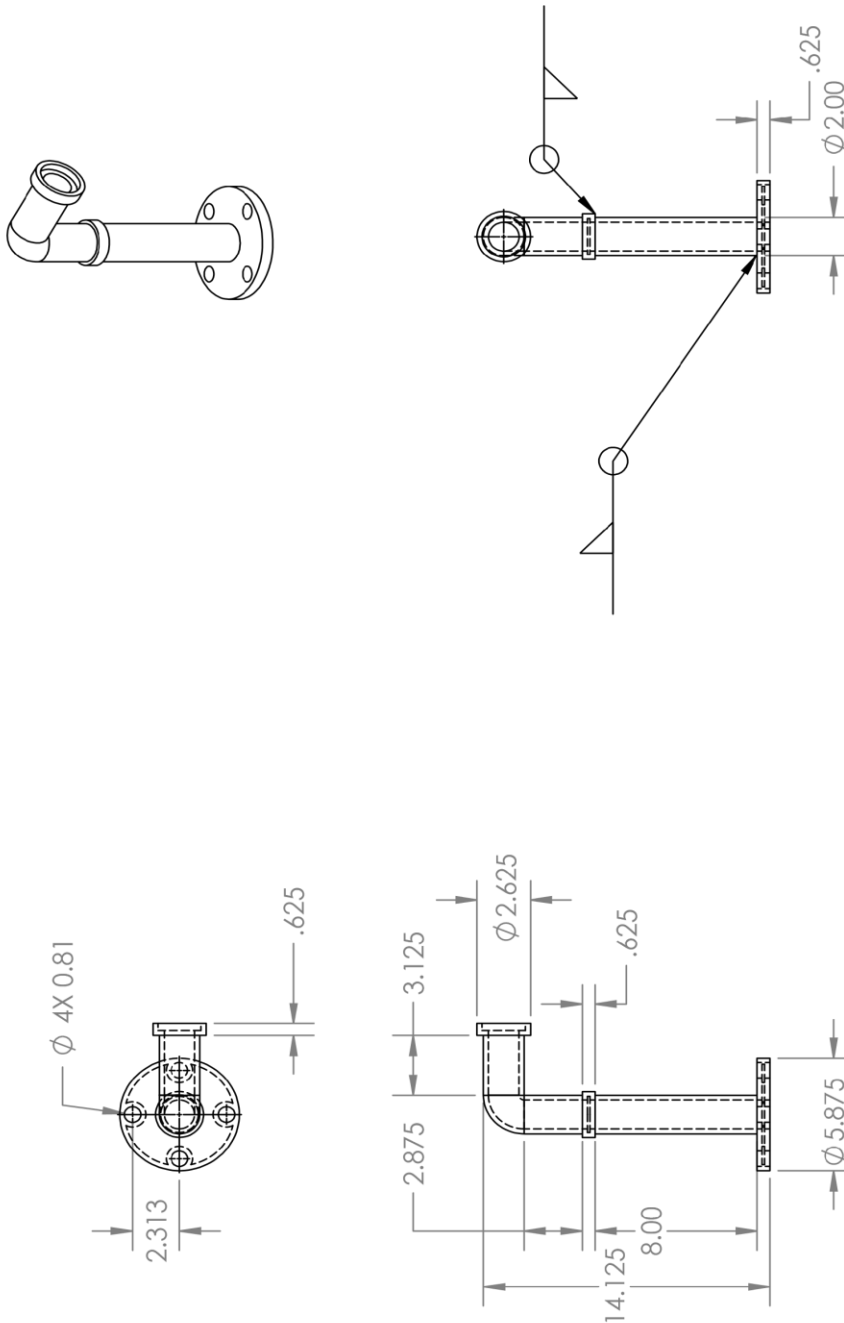
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# CIMWD-212 Syllabus

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DRAWN		NAME	DATE	TITLE: CIMWD-212 Project 1	SIZE	DWG. NO.	REV			
CHECKED		J.SIBERT	3/27/15					A	PIPE	0
ENG APPR.								SCALE: 1:8	WEIGHT:	SHEET 1 OF 1
MFG APPR.										
Q.A.										
UNLESS OTHERWISE SPECIFIED:				COMMENTS:						
DIMENSIONS ARE IN INCHES				INTERPRET GEOMETRIC TOLERANCING PER:						
TOLERANCES:				MATERIAL						
FRACTIONAL ±				FINISH						
ANGULAR: MACH ±				DO NOT SCALE DRAWING						
BEND ±										
TWO PLACE DECIMAL ±										
THREE PLACE DECIMAL ±										
PROPRIETARY AND CONFIDENTIAL				APPLICATION						
THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF SolidWorks Educational Edition. For Instructional Use Only.				USED ON						
NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF SOLIDWORKS CORPORATION.				APPLICATION						
1				2						
3				4						
5										





## CIMWD-212 Syllabus

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#### ***Welding Procedure Specification***

WPS Name	CIMWD-212 Project 1
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Weld Type	Fillet
Welding Process	SMAW or GTAW
Position	1G and 2G
Material	3" Sch. 80 Pipe
Joint Type	Tee and Lap
Backing Option	
Backing Material	

Polarity	DC+
Electrode	E6010 3/32, E7018 3/32
Transfer Mode	
Tungsten Electrode	Or 2% Ceriated
Shielding Gas	100% Argon
Flow Rate	25cfh
Cup Size	

#### ***Welding Procedure***

Weld Layers	Pass No.	Process	Filler Metal Classification	Filler Metal Diameter in (mm)	Current Amps	Current Type and Polarity	Wire Feed Speed	Volts	Remarks
Stringer		SMAW	E7018	3/32	75a	DC+			
Stringer		GTAW	ER70s-6	1/16 or 3/32	120a	"			





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Technique:

SMAW- Align socket and flange and weld socket in 1G and Flange in 2G

GTAW- 1G and 2G use ER70s-6 1/16" or 3/32" filler metal

Initial/Interpass Cleaning- Chip and Brush

Number of Electrodes-

Heat Treatment:

Preheat Temperature-

Post Heat Temperature-

Interpass Temperature- Quench between passes

Stress Relieving-

Additional Notes:

Show the instructor progress every 30 minutes minimum.







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