Western Technical College

31442326  Welding - Gas Metal Arc 3 (GMAW)

Course Outcome Summary

Course Information

<table>
<thead>
<tr>
<th>Description</th>
<th>The study of welding techniques and applications of the gas metal arc welding process using the spray and pulsed modes of metal transfer. The welding will include steel, aluminum and stainless steel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Cluster</td>
<td>Manufacturing</td>
</tr>
<tr>
<td>Instructional Level</td>
<td>Technical Diploma Courses</td>
</tr>
<tr>
<td>Total Credits</td>
<td>2</td>
</tr>
<tr>
<td>Total Hours</td>
<td>72</td>
</tr>
</tbody>
</table>

Textbooks


Learner Supplies

Welding sateen jacket, welding work gloves (long leather gauntlet, short leather work gloves, TIG welding gloves), welding helmet, leather cape and sleeves. **Vendor:** To be discussed in class. Required.  
Tools: 25’ steel tape measure, metal combination square, and scribe. **Vendor:** To be discussed in class. Required.  
Six inch leather steel toed work books - $75.00-150.00. **Vendor:** To be discussed in class. Required.  
Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. Required.

Success Abilities

1. Apply mathematical concepts.  
2. Demonstrate ability to think critically.  
3. Demonstrate ability to value self and work ethically with others in a diverse population.  
4. Make decisions that incorporate the importance of sustainability.  
5. Transfer social and natural science theories into practical applications.  
6. Use effective communication skills.  
7. Use technology effectively.
Program Outcomes
1. Demonstrate industry recognized safety practices
2. Interpret welding drawings
3. Produce gas metal arc welds (GMAW)
4. Produce flux core welds
5. Perform thermal cutting

Course Competencies

1. **Weld1F T joint, 1/2" fillet multipass. FCAW-GS**
   
   Assessment Strategies
   1.1. Skill Demonstration

   Criteria
   
   You will know you are successful when:
   
   1.1. you reference the WPS guidelines.
   1.2. you locate correct material thickness and shear to size.
   1.3. you meet weld quality as per AWS D1.1 or D1.3.
   1.4. you wear PPE and follow all safety guidelines.
   1.5. you set up, shut down, and maintain equipment and work area.
   1.6. you adjust, re-do, and complete welds after feedback if necessary.

   Learning Objectives
   
   1.a. Illustrate the parts of the weld, including the angles and how they are measured.
   1.b. Explore techniques to achieve the desired weld on various metals.
   1.c. Identify the application of the weld.
   1.d. Examine the acceptance criteria for a completed weld.

2. **Weld 1G Single V groove, multipass 3/8" plate. FCAW-GS**
   
   Assessment Strategies
   2.1. Skill Demonstration

   Criteria
   
   You will know you are successful when:
   
   2.1. you reference the WPS guidelines.
   2.2. you locate correct material thickness and shear to size.
   2.3. you meet weld quality as per AWS D1.1 or D1.3.
   2.4. you wear PPE and follow all safety guidelines.
   2.5. you set up, shut down, and maintain equipment and work area.
   2.6. you adjust, re-do, and complete welds after feedback if necessary.

   Learning Objectives
   
   2.a. Illustrate the parts of the weld, including the angles and how they are measured.
   2.b. Explore techniques to achieve the desired weld on various metals.
   2.c. Identify the application of the weld.
   2.d. Examine the acceptance criteria for a completed weld.

3. **Weld 2F, 3/8" fillet, multipass. FCAW-GS**
   
   Assessment Strategies
   3.1. Skill Demonstration

   Criteria
   
   You will know you are successful when:
   
   3.1. you reference the WPS guidelines.
   3.2. you locate correct material thickness and shear to size.
3.3. you meet weld quality as per AWS D1.1 or D1.3.
3.4. you wear PPE and follow all safety guidelines.
3.5. you set up, shut down, and maintain equipment and work area.
3.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
3.a. Illustrate the parts of the weld, including the angles and how they are measured.
3.b. Explore techniques to achieve the desired weld on various metals.
3.c. Identify the application of the weld.
3.d. Examine the acceptance criteria for a completed weld.

4. **Weld 2G, 3/8” V groove, multipass. FCAW-GS**

Assessment Strategies
4.1. Skill Demonstration

Criteria
You will know you are successful when:
4.1. you reference the WPS guidelines.
4.2. you locate correct material thickness and shear to size.
4.3. you meet weld quality as per AWS D1.1 or D1.3.
4.4. you wear PPE and follow all safety guidelines.
4.5. you set up, shut down, and maintain equipment and work area.
4.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
4.a. Illustrate the parts of the weld, including the angles and how they are measured.
4.b. Explore techniques to achieve the desired weld on various metals.
4.c. Identify the application of the weld.
4.d. Examine the acceptance criteria for a completed weld.

5. **Weld 3F, 3/8” multipass. FCAW-GS**

Assessment Strategies
5.1. Skill Demonstration

Criteria
You will know you are successful when:
5.1. you reference the WPS guidelines.
5.2. you locate correct material thickness and shear to size.
5.3. you meet weld quality as per AWS D1.1 or D1.3.
5.4. you wear PPE and follow all safety guidelines.
5.5. you set up, shut down, and maintain equipment and work area.
5.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
5.a. Illustrate the parts of the weld, including the angles and how they are measured.
5.b. Explore techniques to achieve the desired weld on various metals.
5.c. Identify the application of the weld.
5.d. Examine the acceptance criteria for a completed weld.


Assessment Strategies
6.1. Skill Demonstration

Criteria
You will know you are successful when:
6.1. you reference the WPS guidelines.
6.2. you locate correct material thickness and shear to size.
6.3. you meet weld quality as per AWS D1.1 or D1.3.
6.4. you wear PPE and follow all safety guidelines.
6.5. you set up, shut down, and maintain equipment and work area.
6.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
6.a. Illustrate the parts of the weld, including the angles and how they are measured.
6.b. Explore techniques to achieve the desired weld on various metals.
6.c. Identify the application of the weld.
6.d. Examine the acceptance criteria for a completed weld.

7. **Weld 4F T joint, 3/8" multipass. FCAW-GS**

Assessment Strategies
7.1. Skill Demonstration

Criteria

*You will know you are successful when:*
7.1. you reference the WPS guidelines.
7.2. you locate correct material thickness and shear to size.
7.3. you meet weld quality as per AWS D1.1 or D1.3.
7.4. you wear PPE and follow all safety guidelines.
7.5. you set up, shut down, and maintain equipment and work area.
7.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
7.a. Illustrate the parts of the weld, including the angles and how they are measured.
7.b. Explore techniques to achieve the desired weld on various metals.
7.c. Identify the application of the weld.
7.d. Examine the acceptance criteria for a completed weld.

8. **Weld 4G Single V groove with backing. 3/8" plate. FCAW-GS**

Assessment Strategies
8.1. Skill Demonstration

Criteria

*You will know you are successful when:*
8.1. you reference the WPS guidelines.
8.2. you locate correct material thickness and shear to size.
8.3. you meet weld quality as per AWS D1.1 or D1.3.
8.4. you wear PPE and follow all safety guidelines.
8.5. you set up, shut down, and maintain equipment and work area.
8.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
8.a. Illustrate the parts of the weld, including the angles and how they are measured.
8.b. Explore techniques to achieve the desired weld on various metals.
8.c. Identify the application of the weld.
8.d. Examine the acceptance criteria for a completed weld.

9. **Weld 3G, Single V groove, multipass, 3/8" plate. uphill progression. FCAW-S**

Assessment Strategies
9.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*
9.1. you reference the WPS guidelines.
9.2. you locate correct material thickness and shear to size.
9.3. you meet weld quality as per AWS D1.1 or D1.3.
9.4. you wear PPE and follow all safety guidelines.
9.5. you set up, shut down, and maintain equipment and work area.
9.6. you adjust, re-do, and complete welds after feedback if necessary.
Learning Objectives
9.a. Illustrate the parts of the weld, including the angles and how they are measured.
9.b. Explore techniques to achieve the desired weld on various metals.
9.c. Identify the application of the weld.
9.d. Examine the acceptance criteria for a completed weld.

10. **Weld 4G Single V groove, multipass, 3/8" plate. FCAW-S**

Assessment Strategies
10.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*
10.1. you reference the WPS guidelines.
10.2. you locate correct material thickness and shear to size.
10.3. you meet weld quality as per AWS D1.1 or D1.3.
10.4. you wear PPE and follow all safety guidelines.
10.5. you set up, shut down and maintain equipment and work area.
10.6. you adjust, re-do and complete welds after feedback if necessary.

Learning Objectives
10.a. Illustrate the parts of the weld, including the angles and how they are measured.
10.b. Explore techniques to achieve the desired weld on various metals.
10.c. Identify the application of the weld.
10.d. Examine the acceptance criteria for a completed weld.

11. **Weld 1F T joint, multipass 3/8" fillet. Spray Transfer on ferrous and non-ferrous metals.**

Assessment Strategies
11.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*
11.1. you reference the WPS guidelines.
11.2. you locate correct material thickness and shear to size.
11.3. you meet weld quality as per AWS D1.1 or D1.3.
11.4. you wear PPE and follow all safety guidelines.
11.5. you set up, shut down, and maintain equipment and work area.
11.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
11.a. Illustrate the parts of the weld, including the angles and how they are measured.
11.b. Explore techniques to achieve the desired weld on various metals.
11.c. Identify the application of the weld.
11.d. Examine the acceptance criteria for a completed weld.

12. **Weld 1G Single V groove, 3/8" plate, multipass. Spray Transfer on ferrous and non-ferrous metals.**

Assessment Strategies
12.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*
12.1. you reference the WPS guidelines.
12.2. you locate correct material thickness and shear to size.
12.3. you meet weld quality as per AWS D1.1 or D1.3.
12.4. you wear PPE and follow all safety guidelines.
12.5. you set up, shut down, and maintain equipment and work area.
12.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
12.a. Illustrate the parts of the weld, including the angles and how they are measured.
12.b. Explore techniques to achieve the desired weld on various metals.
12.c. Identify the application of the weld.
12.d. Examine the acceptance criteria for a completed weld.

13. **Weld 2F T joint, multipass, 1/2" fillet. Spray Transfer on ferrous and non-ferrous metals.**

Assessment Strategies
13.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

13.1. you reference the WPS guidelines.
13.2. you locate correct material thickness and shear to size.
13.3. you meet weld quality as per AWS D1.1 or D1.3.
13.4. you wear PPE and follow all safety guidelines.
13.5. you set up, shut down, and maintain equipment and work area.
13.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
13.a. Illustrate the parts of the weld, including the angles and how they are measured.
13.b. Explore techniques to achieve the desired weld on various metals.
13.c. Identify the application of the weld.
13.d. Examine the acceptance criteria for a completed weld.

14. **Weld 2G V groove, 3/8" plate, multipass. Spray Transfer on ferrous and non-ferrous metals.**

Assessment Strategies
14.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

14.1. you reference the WPS guidelines.
14.2. you locate correct material thickness and shear to size.
14.3. you meet weld quality as per AWS D1.1 or D1.3.
14.4. you wear PPE and follow all safety guidelines.
14.5. you set up, shut down, and maintain equipment and work area.
14.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
14.a. Illustrate the parts of the weld, including the angles and how they are measured.
14.b. Explore techniques to achieve the desired weld on various metals.
14.c. Identify the application of the weld.

15. **Weld 3F T joint, uphill travel, 3/8" root, 1/2" weave cover. Pulsed Spray**

Assessment Strategies
15.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

15.1. you reference the WPS guidelines.
15.2. you locate correct material thickness and shear to size.
15.3. you meet weld quality as per AWS D1.1 or D1.3.
15.4. you wear PPE and follow all safety guidelines.
15.5. you set up, shut down, and maintain equipment and work area.
15.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
15.a. Illustrate the parts of the weld, including the angles and how they are measured.
15.b. Explore techniques to achieve the desired weld on various metals.
15.c. Identify the application of the weld.
15.d. Examine the acceptance criteria for a completed weld.


Assessment Strategies
16.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

16.1. you reference the WPS guidelines.
16.2. you locate correct material thickness and shear to size.
16.3. you meet weld quality as per AWS D1.1 or D1.3.
16.4. you wear PPE and follow all safety guidelines.
16.5. you set up, shut down, and maintain equipment and work area.
16.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
16.a. Illustrate the parts of the weld, including the angles and how they are measured.
16.b. Explore techniques to achieve the desired weld on various metals.
16.c. Identify the application of the weld.
16.d. Examine the acceptance criteria for a completed weld.

17. **Weld 2F Lap joint, single pass, 7ga metal. Stainless Short Arc.**

Assessment Strategies
17.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

17.1. you reference the WPS guidelines.
17.2. you locate correct material thickness and shear to size.
17.3. you meet weld quality as per AWS D1.1 or D1.3.
17.4. you wear PPE and follow all safety guidelines.
17.5. you set up, shut down, and maintain equipment and work area.
17.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
17.a. Illustrate the parts of the weld, including the angles and how they are measured.
17.b. Explore techniques to achieve the desired weld on various metals.
17.c. Identify the application of the weld.
17.d. Examine the acceptance criteria for a completed weld.

18. **Weld 2F T Joint, 3pass, 3/8” fillet. Stainless Short Arc.**

Assessment Strategies
18.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

18.1. you reference the WPS guidelines.
18.2. you locate correct material thickness and shear to size.
18.3. you meet weld quality as per AWS D1.1 or D1.3.
18.4. you wear PPE and follow all safety guidelines.
18.5. you set up, shut down, and maintain equipment and work area.
18.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
18.a. Illustrate the parts of the weld, including the angles and how they are measured.
18.b. Explore techniques to achieve the desired weld on various metals.
18.c. Identify the application of the weld.
18.d. Examine the acceptance criteria for a completed weld.

19. **Weld 3F T Joint, up and downhill travel, 3/8” fillet. Stainless Short Arc.**
Assessment Strategies
19.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

19.1. you reference the WPS guidelines.
19.2. you locate correct material thickness and shear to size.
19.3. you meet weld quality as per AWS D1.1 or D1.3.
19.4. you wear PPE and follow all safety guidelines.
19.5. you set up, shut down, and maintain equipment and work area.
19.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
19.a. Illustrate the parts of the weld, including the angles and how they are measured.
19.b. Explore techniques to achieve the desired weld on various metals.
19.c. Identify the application of the weld.
19.d. Examine the acceptance criteria for a completed weld.

20. **Weld 3G Single V groove, uphill with backing, 3/8” plate. Stainless Short Arc**

Assessment Strategies
20.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

20.1. you reference the WPS guidelines.
20.2. you locate correct material thickness and shear to size.
20.3. you meet weld quality as per AWS D1.1 or D1.3.
20.4. you wear PPE and follow all safety guidelines.
20.5. you set up, shut down, and maintain equipment and work area.
20.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
20.a. Illustrate the parts of the weld, including the angles and how they are measured.
20.b. Explore techniques to achieve the desired weld on various metals.
20.c. Identify the application of the weld.
20.d. Examine the acceptance criteria for a completed weld.


Assessment Strategies
21.1. Skill Demonstration

Criteria

*Performance will meet expectations when:*

21.1. you reference the WPS guidelines.
21.2. you locate correct material thickness and shear to size.
21.3. you meet weld quality as per AWS D1.1 or D1.3.
21.4. you wear PPE and follow all safety guidelines.
21.5. you set up, shut down, and maintain equipment and work area.
21.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives
21.a. Illustrate the parts of the weld, including the angles and how they are measured.
21.b. Explore techniques to achieve the desired weld on various metals.
21.c. Identify the application of the weld.
21.d. Examine the acceptance criteria for a completed weld.


Assessment Strategies
22.1. Skill Demonstration
Criteria

You will know you are successful when:

22.1. you reference the WPS guidelines.
22.2. you locate correct material thickness and shear to size.
22.3. you meet weld quality as per AWS D1.1 or D1.3.
22.4. you wear PPE and follow all safety guidelines.
22.5. you set up, shut down, and maintain equipment and work area.
22.6. you adjust, re-do, and complete welds after feedback if necessary.

Learning Objectives

22.a. Illustrate the parts of the weld, including the angles and how they are measured.
22.b. Explore techniques to achieve the desired weld on various metals.
22.c. Identify the application of the weld.
22.d. Examine the acceptance criteria for a completed weld.