WELDING COURSE OUTLINE

93 to 133 Hours
- 23 Instructional Hours
- 70 Self-Study Hours
- 40 Externship Hours (when offered with externship)

Duration 3 or 6 months • Mentor Supported

No Prerequisites Required

Certificate in Welding Theory

This comprehensive welding course covers every type of welding from gas to ARC, MIG to TIG. Students will learn welding theory, welding safety, tank set up, types of welding, welding in 2G, 3G and 4G positions, and cutting. Students will see up close views of the instruction so they can quickly learn the fine detail of such precision work as how to hold the welding equipment, puddling and cutting in every type of welding operation.

SEGMENT OBJECTIVES:

➢ To demonstrate general comprehension of the trade knowledge presented in the video instruction (see outline of video instruction segments) as evidenced by passing the online examinations with a score of 80% or higher.
➢ To demonstrate general comprehension of the trade knowledge involved in the learning objectives below as evidenced by passing the online examinations with a score of 80% or higher.

1. Identify some common hazards in welding.
2. Explain and identify proper personal protection used in welding.
3. Describe how to avoid welding fumes.
4. Explain some of the causes of accidents.
5. Identify and explain uses for material safety data sheets.
6. Explain safety techniques for storing and handling cylinders.
7. Explain how to avoid electric shock when welding.
8. Describe proper material handling methods.
9. Identify and explain the use of oxyfuel cutting equipment.
10. Set up oxyfuel equipment.
11. Light and adjust an oxyfuel torch.
12. Shut down oxyfuel cutting equipment.
13. Disassemble oxyfuel equipment.

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15. Perform oxyfuel cutting, including a straight line and square shapes, piercing and slot cutting, bevels, washing, and gouging.
16. Operate a motorized, portable oxyfuel gas cutting machine.
17. Identify and explain shielded metal arc welding (SMAW) safety.
18. Explain welding electrical current.
19. Identify welding power supplies and their characteristics.
20. Explain how to set up welding power supplies.
21. Set up a machine for welding.
22. Identify tools used for weld cleaning.
23. Identify factors that affect electrode selection.
24. Explain the American Welding Society (AWS) and the American Society of Mechanical Engineers (ASME) filler metal classification system.
25. Identify different types of filler metals.
26. Explain filler metal traceability requirements and how to use applicable code requirements.
27. Identify and select the proper electrode for a specified welding task.
28. Set up SMAW equipment.
29. Describe methods of striking an arc.
30. Properly strike and extinguish an arc.
31. Describe causes of arc blow and wander.
32. Make stringer, weave, and overlapping beads.
33. Make fillet welds in the horizontal (2F), vertical (3F), and overhead (4F) positions.
34. Explain gas metal arc welding (GMAW) and flux-cored arc welding (FCAW) safety.
35. Explain the characteristics of welding current and power sources.
36. Identify and explain the use of GMAW and FCAW equipment, including spray transfer, globular transfer, short circuiting, and pulse.
37. Identify and explain the use of GMAW and FCAW shielding gases and filler metals.
38. Set up GMAW and FCAW equipment and identify tools for weld cleaning.
40. Perform GMAW-S (short-circuit) multiple-pass V-groove welds on carbon steel plate coupons in multiple positions (with or without backing), using solid or composite wire and shielding gas.
41. Perform GMAW spray fillet and V-groove welds on carbon steel plate coupons in multiple positions (with or without backing), using solid or composite wire and shielding gas.
42. Perform FCAW multiple-pass fillet welds on carbon steel plate coupons in multiple positions, using flux-cored wire and, if required, shielding gas.
43. Perform FCAW multiple-pass V-groove welds on carbon steel plate coupons in multiple positions (with or without backing), using flux-cored wire and, if required, shielding gas.


METHOD OF INSTRUCTION: Correspondence. This course is heavily dependent upon video instruction; however, the students have access to instructors (subject matter experts) via email, and students have an option to be placed in a local externship with an employer.