Introduction to Metal Inert Gas and Flux Cored Arc Welding

Introduction to metal inert gas (MIG) welding and flux cored arc welding (FCAW) is a one-credit course that provides students with opportunities to examine safety and technical information in metal fabrication and participate in hands-on activities in the laboratory. Topics include career opportunities, safety, planning metal structures, identification and selection, and weld quality.

Content standards for this course are not intended to serve as the entire curriculum. Teachers are encouraged to expand the curriculum beyond the limits of these content standards to accommodate specific community interests and utilize local resources. This course encourages critical thinking, use of the scientific method, integration of technology, development of student leadership skills, and application of knowledge and skills related to practical questions and problems. Safety concepts are integrated into instruction to the maximum extent possible.

Career and technical student organizations are integral, cocurricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Career Opportunities

Students will:

1. Identify career opportunities in MIG welding and FCAW.

Safety

2. Demonstrate safety concepts required in MIG welding and FCAW.

Planning Metal Structures

3. Interpret welding symbols on blueprints.

4. Explain the procedure for planning and estimating materials needed to complete a metal fabrication project.

5. Explain the importance of metal preparation for welding.

Identification and Selection

6. Determine uses of tools and equipment in MIG welding and FCAW.

   Examples: tools—hacksaw, cold chisel, file, drill, chipping hammer, metal vise grips, grinder, striker, tip cleaner, wire brush, tongs

   equipment—welding helmet, fuel valves, MIG welder, FCAW welder
7. Distinguish among types of metal, used in MIG welding and FCAW.
   Examples: iron, aluminum, steel, tin, titanium, copper, magnesium, chromium, zinc

**Weld Quality**

8. Critique MIG welding and FCAW welds for imperfections.
   - Determining corrective measures to improve welds
   - Explaining weld testing methods

9. Explain various parts of MIG welding and FCAW machines.

10. Compare shades of lenses needed in MIG welding and FCAW.

11. Explain how tensile strength, polarity, and rate of travel affect weld quality.

12. Demonstrate the use of MIG and FCAW welders.
   - Identifying various types of weld joints
     Examples: butt, lap, corner, T
   - Adjusting MIG welding and FCAW machine settings for welding
   - Utilizing flat, vertical, horizontal, and overhead welding positions
   - Identifying stringer, weave, overlap, and fillet welds