Welding Core: Shielded Metal Arc Welding (SMAW)
Course Outcome Summary

Course Information

Description
Through classroom and/or lab/shop learning and assessment activities, students in this course will: describe the Shielded Metal Arc Welding process (SMAW); demonstrate the safe and correct set up of the SMAW workstation; associate SMAW electrode classifications with base metals and joint criteria; demonstrate proper electrode selection and use based on metal types and thicknesses; build pads of weld beads with selected electrodes in the flat position; build pads of weld beads with selected electrodes in the horizontal position; perform basic SMAW welds on selected weld joints; and perform visual inspection of welds.

Types of Instruction

Instruction Type
Instruction Type

Competencies

1. Explain the Shielded Metal Arc Welding process (SMAW).
   Properties
   Domain: Cognitive   Level: Analysis
   You will demonstrate your competence:
   o through a written or oral instructor-provided evaluation tool
   Your performance will be successful when:
   o you differentiate between types and uses of current
   o you identify the advantages and disadvantages of SMAW
   o you identify types of welding power sources
   o you identify different components of a SMAW station
   o you describe basic electrical safety

2. Demonstrate the safe and correct set up of the SMAW workstation.
   Properties
   Domain: Cognitive   Level: Application
   You will demonstrate your competence:
   o in the lab or shop setting
   o using SMAW equipment
   Your performance will be successful when:
   o you demonstrate proper inspection of equipment
   o you demonstrate proper use of PPE
   o you demonstrate proper placement of workpiece connection
   o you check for proper setup of equipment
   o you inspect area for potential hazards/safety issues

3. Relate SMAW electrode classifications with base metals and joint criteria
   Properties
Domain: Cognitive   Level: Analysis

You will demonstrate your competence:
  o through a written or oral instructor-provided evaluation tool

Your performance will be successful when:
  o you explain the AWS electrode nomenclature
  o you determine proper electrode for given joint based on material and position of weld
  o you determine proper type of electrodes to be used in a variety of industry applications
  o you identify proper electrode storage and handling

4. **Demonstrate proper electrode selection and use based on metal types and thicknesses**

   **Properties**

   Domain: Cognitive   Level: Application

   You will demonstrate your competence:
   o in the lab or shop setting
   o using SMAW equipment

   Your performance will be successful when:
   o you select the proper electrode type and size relative to metal size, type and thickness
   o you select the proper electrode type and size based on material specifications

5. **Build pads of weld beads with selected electrodes in the flat position**

   **Properties**

   Domain: Psychomotor   Level:

   You will demonstrate your competence:
   o in the lab or shop setting
   o using SMAW equipment

   Your performance will be successful when:
   o you use the proper safety procedures and PPE
   o you use the proper setup procedures
   o you create a pad of beads using SMAW electrode
   o your weld exhibits proper uniformity and profile

6. **Build pads of weld beads with selected electrodes in the horizontal position**

   **Properties**

   Domain: Psychomotor

   You will demonstrate your competence:
   o in the lab or shop setting

   Your performance will be successful when:
   o you use the proper safety procedures and PPE
   o you use the proper setup procedures
   o you create a pad of beads using SMAW electrode
   o your weld exhibits proper uniformity and profile

7. **Perform basic SMAW welds on selected weld joints.**

   **Properties**

   Domain: Psychomotor

   You will demonstrate your competence:
   o in the lab or shop setting
   o using SMAW equipment
Using appropriate tools

Your performance will be successful when:
- you use the proper setup procedures
- you use the proper safety procedures and PPE
- you perform a fillet weld in horizontal position
- you perform fillet weld in flat position
- you perform a groove weld in a flat position
- you perform a groove weld in a horizontal position
- you use tools appropriate for the task

8. **Perform visual inspection of welds**

**Properties**

Domain: Psychomotor

You will demonstrate your competence:
- in the lab or shop setting
- using appropriate inspection tools

Your performance will be successful when:
- you identify common visual discontinuities and defects on welds
- you determine causes of discontinuities and defects of welds
- you inspect welds for pass/fail ratings according to industry standards
- you use appropriate inspection tools