

COURSE OUTLINE **Industrial Welding III**

Course Description

WE 152. Industrial Welding III. 6 hours credit. Prerequisite: A score at a pre-determined level on a placement instrument. This course will enable the student to recognize and apply proper fundamentals of shielded arc metal welding. The student will weld steel in all applicable positions with several types of electrodes, emphasizing fundamentals and procedure. The student will apply proper safety practices throughout the course.

Course Relevance

The fundamental skills acquired in this course will affect the student's workplace outcomes throughout their careers. Intrinsic core abilities will have long-term economic impact upon the student's earning capacity.

Required Materials

Selected personal safety items and tools as dictated by the instructor.

Learning Outcomes

The intention is for the student to be able to:

1. Demonstrate safety in the use of shielded metal arc welding.
2. Demonstrate basic shielded metal arc welding skills using a variety of different electrodes primarily through booth exercises and shop experiences.
3. Explain the fundamental theories of shielded metal arc welding through written and/or classroom exercises.

Learning PACT Skills that will be DEVELOPED and documented in this course

Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Technology Skills

1. Discipline-specific technology
 - Through the use of current industry technology, the student will learn to perform specific welding procedures according to the American Welding Society (AWS) standards.

Major Summative Assessment Task(s)

These learning outcome(s) and the Learning PACT skill(s) will be demonstrated by:

1. Performing a specific AWS testing procedure selected by the department.

Course Content

- I. Skills/Competencies – Actions that are essential to achieve the course outcomes:
 - A. Perform specific weld profiles with various electrodes in the flat welding position
 - B. Perform specific weld profiles with various electrodes in the vertical welding position

- C. Perform specific weld profiles with various electrodes in the overhead welding position

Learning Units

- I. Safety in the welding shop
 - A. Accidents
 - B. General shop safety
 - C. Safety in the welding environment
 - D. Oxy-fuel Gas Welding and cutting safety
 - E. Arc welding and cutting safety
 - F. Resistance welding safety
 - G. Safety around welding robots
 - H. Special welding process safety

- II. Shielded metal arc welding equipment and supplies
 - A. Arc welding power source classifications
 - B. Constant current power sources
 - C. NEMA arc welding power source classifications
 - D. Welding leads
 - E. SMAW electrodes
 - F. Carbon and low-alloy steel covered electrode classification
 - G. Non-ferrous electrode classifications
 - H. Electrodes care
 - I. Power source remote controls
 - J. Weld-cleaning equipment
 - K. Shields and helmets
 - L. Special arc welder clothing

- III. Shielded metal arc welding
 - A. Direct Current (DC) arc welding fundamentals
 - B. DCEN and DCEP fundamentals
 - C. Alternating Current (AC) arc welding fundamentals
 - D. Selecting an arc welding machine
 - E. Starting, stopping, and adjusting the Arc Welding Power Source (SMAW)
 - F. DC arc blow
 - G. Arc welded joint designs

Learning Activities

Learning activities will be hands on exercises in both booth and shop. Classroom lecture is designed to enable the students to understand the key principles in process analysis, welding fundamentals, process and electrode classification analysis, and correct use of associated equipment.

Grade Determination

The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: adequate participation (discussion), projects, and other methods of evaluation employed at the discretion of the instructor(s).