HIGHLAND COMMUNITY COLLEGE

Syllabus

IWT135 or IWT135WA Gas Metal Arc Welding
3 Credit Hours (Lecture/Lab)
Prerequisite: None
C & I Revision Date: 02/14/2025

Department:

Welding Technology

Course Description:

Through classroom and /or lab/shop learning and assessment activities, students in this course will: explain Gas Metal Arc Welding process (GMAW); demonstrate the safe and correct set up of the GMAW workstation; correlate GMAW 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 electrode in the flat position; build pads of weld beads with selected electrode in the horizontal position; perform basic GMAW welds on selected weld joints; and perform visual inspection of GMAW welds.

Course Competencies:

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Postsecondary Technical Education Authority (TEA) for this course as approved by the Kansas Board of Regents.

Upon completion of the course, the student should be able to:

1. Explain gas metal arc welding process (GMAW).
    a. describe different modes of transfer
    b. differentiate between types and uses of current
    c. identify the advantages and disadvantages of GMAW
    d. identify types of welding power sources
    e. identify different components of a GMAW station
    f. describe basic electrical safety
2. Demonstrate the safe and correct set up of the GMAW workstation
    a. demonstrate proper inspection of equipment
    b. demonstrate proper use of PPE
    c. demonstrate proper placement of workpiece connection
    d. check for proper setup of equipment
    e. inspect area for potential hazards/safety issues
    f. troubleshoot the GMAW equipment and perform minor maintenance
3. Correlate GMAW electrode classifications with base metals and joint criteria
    a. explain the AWS electrode nomenclature
    b. determine proper electrode for given joint based on material and position of weld
    c. determine proper type of electrodes to be used in a variety of industry applications
    d. identify proper electrode storage and handling
    e. identify consumables
4. Demonstrate proper electrode selection and use based on metal types and thicknesses
    a. identify consumables for various electrode sizes
    b. select the proper electrode type and size relative to metal size, type and thickness

    c. select the proper electrode type and size based on material specifications
5. Build pads of weld beads with selected electrodes in the flat position
    a. implement safety procedures and PPE
    b. implement proper equipment setup
    c. use the proper metal transfer
    d. create a pad of beads using GMAW
    e. your weld exhibits proper uniformity and profile
6. Build pads of weld beads with selected electrodes in the horizontal position
    a. implement safety procedures and PPE
    b. implement proper equipment setup
    c. use the proper metal transfer
    d. create a pad of beads using GMAW
    e. your weld exhibits proper uniformity and profile
7. Produce basic GMAW welds on selected weld joints.
    a. implement safety procedures and PPE
    b. implement proper equipment setup
    c. perform fillet weld in flat position
    d. perform a fillet weld in horizontal position
    e. perform a groove weld in a flat position
    f. perform a groove weld in a horizontal position
    g. use tools appropriate for the task
8. Conduct visual inspection of GMAW welds
    a. identify common visual discontinuities and defects on welds
    b. determine causes of discontinuities and defects of welds
    c. inspect welds for pass/fail ratings according to industry standards
    d. use appropriate tools for inspection

Course Content:

A. GMAW (short circuit)
    1. Workstation set up
        a. Pad welding
        b. AWS-1 welding test
        c. AWS2-4-3 (70S6 plate test w/backing)
B. GMAW (spray transfer)
    1. Workstation set up
        a. Pad welding
        b. AWS-3 welding test
        c. AWS2-4-5 (70S6 plate test w/backing)
C. FCAW (flux cored arc welding)
    1. Workstation set up
        a. Pad welding
        b. AWS-2 welding test
        c. AWS2-4-9 (70T6 plate test w/backing)

Learning Assessments:

Assessments may include quizzes, tests, project work, demonstrated competence, instructor observation, weekly assignments and/or written papers.

Instructional Materials:

Textbooks: Moniz, B. J. (2015). *Welding Skills* (5th ed.). Orland Park, IL: American Technical Publishers. ISBN-13: 978-0826930842

Gosse, J. F. (2015). *Welding Skills Workbook* (5th ed.). Orland Park, IL: American Technical Publishers. ISBN-13: 978-0826930859

Proctor, T.E. & Gosse, J. F. (2014). *Printreading for Welders* (5th ed.). Orland Park, IL: American Technical Publishers. ISBN-13: 978-0826930712

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our Disability Services website.

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an online report about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our Equity Grievance Policy.