

Department:

Welding Technology

Course Description:

Through classroom and /or lab/shop learning and assessment activities, students in this course will: describe the Gas Tungsten Arc Welding process (GTAW); demonstrate the safe and correct set up of the GTAW workstation; relate GTAW electrode classification with base metals and joint criteria; build proper electrode selection and filler metal selection use based on metal types and thicknesses; build pads of weld beads with selected electrode and filler material in the flat position; build pads of weld beads with selected electrode and filler material in the horizontal position; perform basic GTAW welds on selected weld joints; and perform visual inspection of GTAW 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 the gas tungsten arc welding process (GTAW)
 - a. differentiate between types and uses of current
 - b. identify the advantages and disadvantages of GTAW
 - c. identify types of welding power sources
 - d. identify different components of a GTAW workstation
 - e. describe basic electrical safety
2. Demonstrate the safe and correct set up of the GTAW 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 GTAW equipment and perform minor maintenance
3. Relate GTAW electrode and filler metal classifications with base metals and joint criteria
 - a. identify electrode classifications
 - b. explain the AWS electrode and filler metal nomenclature
 - c. determine proper electrode and filler metal for given joint based on material and position of weld
 - d. determine proper type of electrodes to be used in a variety of industry applications
4. Build proper electrode and filler metal selection and use based on metal types and thicknesses
 - a. use safety hazard precautions and PPE
 - b. properly prepare the tungsten electrode profile relative to base material
 - c. perform weld using GTAW process appropriate to electrode size and filler metal size

- d. select the proper electrode and filler metal type and size relative to metal size, type and thickness
 - e. select the proper electrode and filler metal type and size based on material specifications
 - f. use tools appropriate for the task
5. Build pads of weld beads with selected electrodes and filler material in the flat position
 - a. use safety hazard precautions and PPE
 - b. demonstrate proper equipment setup and troubleshooting
 - c. create a pad of beads using GTAW process
 - d. your weld exhibits proper uniformity and profile
6. Build pads of weld beads with selected electrodes and filler material in the horizontal
 - a. use safety hazard precautions and PPE
 - b. demonstrate proper equipment setup and troubleshooting
 - c. create a pad of beads using GTAW process
 - d. your weld exhibits proper uniformity and profile
7. Perform basic GTAW welds on selected weld joints
 - a. conduct proper base metal preparation
 - b. use safety hazard precautions and PPE
 - c. demonstrate proper equipment setup and troubleshooting
 - d. perform fillet weld in flat position
 - e. perform a fillet weld in horizontal position
 - f. perform a groove weld in a flat position
 - g. perform a groove weld in a horizontal position
 - h. use tools appropriate for the task
8. Perform visual inspection of GTAW 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 tools appropriate for the inspection

Course Content:

- A. GTAW (Carbon Steel)
 1. Workstation set up
 - a) Pad welding
 - b) AWS-7 welding test
- B. GTAW (Stainless Steel)
 1. Workstation set up
 - a) Pad welding
 - b) AWS-4 welding test
- C. GTAW (Aluminum)
 1. Workstation set up
 - a) Pad welding
 - b) AWS-5 welding test

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](#).