

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Advanced GTAW
COURSE NUMBER	WELD 0240
DIVISION	Career and Technical Education
DEPARTMENT	WELD
CIP CODE	48.0508
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1 Lab: 6 Clinical:
PREREQUISITES	WELD 0140

COURSE DESCRIPTION

Through classroom and/or lab/shop learning and assessment activities, students in this course will: explain the gas tungsten arc welding (GTAW) process; demonstrate the safe and correct set up of the GTAW workstation; relate GTAW electrode and filler metal classifications with base metals and joint criteria; build proper electrode and filler metal selection and use based on metal types and thicknesses; build pads of weld beads with selected electrodes and filler material in the vertical position; build pads of weld beads with selected electrodes and filler material in the overhead position; perform basic GTAW welds on selected weld joints; and perform visual inspection of GTAW welds.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. The student will be able to identify high risk areas that should be avoided by operators while automated machinery is running.
2. After completing the program, students will be able to exhibit a high-level of professionalism including appropriate dress, attendance, communication skills and other soft skills necessary
3. The student will be able to demonstrate the ability to successfully complete a welding project.

TEXTBOOKS

<http://kckccbbookstore.com/>

METHOD OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. GTAW welding in the vertical position
 - A. Fillet welds (3F)
 - B. Groove welds (3G)
- II. GTAW welding in the overhead position
 - A. Fillet welds (4F)
 - B. Groove welds (4G)
- III. Weld inspection
 - A. GTAW visual inspection
 1. Visual inspection criteria
 2. Common discontinuities in vertical and overhead positions
 - B. GTAW nondestructive testing
 1. Ultrasound testing
 2. Radiograph testing
 3. Penetrant testing
 4. Magnetic particle testing

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Demonstrate the safe and correct set up of the GTAW workstation.
 1. Demonstrate proper inspection of equipment
 2. Demonstrate proper use of PPE
 3. Demonstrate proper placement of work piece connection
 4. Check for proper setup of equipment
 5. Inspect area for potential hazards/safety issues
 6. Troubleshoot the GTAW equipment and perform minor maintenance
- B. Relate GTAW electrode and filler metal classifications with base metals and joint criteria.
 7. Identify electrode classifications
 8. Explain the AWS electrode and filler metal nomenclature
 9. Determine proper electrode and filler metal for given joint based on material and position of weld
 10. Determine proper type of electrodes to be used in a variety of industry applications
- C. Build proper electrode and filler metal selection and use based on metal types and thicknesses.
 11. Use safety hazard precautions and PPE
 12. Properly prepare the tungsten electrode profile relative to base material
 13. Perform weld using GTAW process appropriate to electrode size and filler metal size
 14. Select the proper electrode and filler metal type and size relative to metal size, type and thickness
 15. Select the proper electrode and filler metal type and size based on material specifications
 16. Use tools appropriate for the task

- D. Build pads of weld beads with selected electrodes and filler material in the Vertical position.
 - 17. Use safety hazard precautions and PPE
 - 18. Demonstrate proper equipment setup and troubleshooting
 - 19. Create a pad of beads using GTAW process
 - 20. Weld exhibits proper uniformity and profile

- E. Build pads of weld beads with selected electrodes and filler material in the Overhead position.
 - 21. Use safety hazard precautions and PPE
 - 22. Demonstrate proper equipment setup and troubleshooting
 - 23. Create a pad of beads using GTAW process
 - 24. Weld exhibits proper uniformity and profile

- F. Perform basic GTAW welds on selected weld joints.
 - 25. Conduct proper base metal preparation
 - 26. Use safety hazard precautions and PPE
 - 27. Demonstrate proper equipment setup and troubleshooting
 - 28. Perform fillet weld in Vertical position
 - 29. Perform a fillet weld in Overhead position
 - 30. Perform a groove weld in a Vertical position
 - 31. Perform a groove weld in a Overhead position
 - 32. Use tools appropriate for the task

- G. Perform visual inspection of GTAW welds.
 - 33. Identify common visual discontinuities and defects on welds
 - 34. Determine causes of discontinuities and defects of welds
 - 35. Inspect welds for pass/fail ratings according to industry standards
 - 36. Use tools appropriate for the inspection

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.