COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	GTAW
COURSE NUMBER	WELD 0140
DIVISION	Career and Technical Education
DEPARTMENT	WELD
CIP CODE	48.0508
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 1 Lab: 4
PREREQUISITES	WELD 0100

COURSE DESCRIPTION
Through classroom and/or lab/shop learning and assessment activities, students in this course will: explain the gas tungsten arc welding process (GTAW); 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. Students will be able to explain job/site and precautions for job site hazards and will be able to determine the use of Personal Protective equipment (PPE) as well as be able to Identify the safety equipment and procedures related to safe work practices and environment

2. Student will be able to demonstrate the use of good communication skills including listening, following directions, speaking, and using correct grammar in conducting a job search.

3. Student will be able to create fillet and groove welds in flat and horizontal positions and identify common visual discontinuities and defects on welds and determine causes of discontinuities and defects of welds.

TEXTBOOKS
http://kckccbookstore.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 Processes and equipment
   A. GTAW equipment
      1. Welding station components
      2. Power sources
      3. Welding torches
   B. GTAW process theory
      1. Machine settings
      2. Electrode specifications
      3. Electrode preparation
      4. Filler metal specifications
      5. Shielding gasses
II. GTAW welding in the flat position
   A. Fillet welds (1F)
   B. Groove welds (1G)
III. GTAW welding in the horizontal position
   A. Fillet welds (2F)
   B. Groove welds (2G)
IV. Weld inspection
   A. GTAW visual inspection
      1. Visual inspection criteria
      2. Common discontinuities in flat and horizontal positions
   B. GTAW destructive weld testing
      1. Weld test joint set up
   2. Preparing test specimens
      3. Destructive test criteria

COURSE LEARNING OUTCOMES AND COMPETENCIES
Upon successful completion of this course, the student will:

A. Explain the gas tungsten arc welding process (GTAW)
   1. Differentiate between types and uses of current
   2. Identify the advantages and disadvantages of GTAW
   3. Identify types of welding power sources
   4. Identify different components of a GTAW workstation
   5. Describe basic electrical safety

B. Demonstrate the safe and correct set up of the GTAW workstation
   6. Demonstrate proper inspection of equipment
   7. Demonstrate proper use of PPE
   8. Demonstrate proper placement of workpiece connection
   9. Check for proper setup of equipment
   10. Inspect area for potential hazards/safety issues
   11. Troubleshoot GTAW equipment and perform minor maintenance

C. Relate GTAW electrode and filler metal classifications with base metals and joint criteria
   12. Identify electrode classifications
   13. Explain the AWS electrode and filler metal nomenclature
   14. Determine proper electrode and filler metal for given joint based on material and position of weld
   15. Determine proper type of electrodes to be used in a variety of industry applications

D. Build proper electrode and filler metal selection and use based on metal types and thicknesses
   16. Use safety hazard precautions and PPE
   17. Properly prepare the tungsten electrode profile relative to base material
   18. Perform weld using GTAW process appropriate to electrode size and filler metal size
   19. Select the proper electrode and filler metal type and size relative to metal size, type and thickness
   20. Select the proper electrode and filler metal type and size based on material specifications
   21. Use tools appropriate for the task

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

F. Build pads of weld beads with selected electrodes and filler material in the horizontal position
   26. Use safety hazard precautions and PPE
   27. Demonstrate proper equipment setup and troubleshooting
   28. Create a pad of beads using GTAW process
   29. Weld exhibits proper uniformity and profile

G. Perform basic GTAW welds on selected weld joints
   30. Conduct proper base metal preparation
   31. Use safety hazard precautions and PPE
   32. Demonstrate proper equipment setup and troubleshooting
   33. Perform fillet weld in flat position
   34. Perform a fillet weld in horizontal position
   35. Perform a groove weld in a flat position
   36. Perform a groove weld in a horizontal position
   37. Use tools appropriate for the task

H. Perform visual inspection of GTAW welds
   38. Identify common visual discontinuities and defects on welds

39. Determine causes of discontinuities and defects of welds
40. Inspect welds for pass/fail ratings according to industry standards
41. 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.