

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Advanced GMAW
COURSE NUMBER	WELD 0230
DIVISION	Career and Technical Education
DEPARTMENT	WELD
CIP CODE	48.0508
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1 Lab: 6 Clinical:
PREREQUISITES	WELD 0130

COURSE DESCRIPTION

Through classroom and/or shop/lab 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 electrodes in the vertical position; build pads of weld beads with selected electrodes in the overhead position; produce basic GMAW welds on selected weld joints; and conduct visual inspection of GMAW 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. GMAW welding in the vertical position
 - A. Fillet welds (3F)
 - B. Groove welds (3G)
- II. GMAW welding in the overhead position
 - A. Fillet welds (4F)
 - B. Groove welds (4G)
- III. Weld inspection
 - A. GMAW visual inspection
 1. Visual inspection criteria
 2. Common discontinuities in vertical and overhead positions
 - B. GMAW 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 GMAW 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 SMAW equipment and perform minor maintenance
- B. Correlate GMAW electrode classifications with base metals and joint criteria.
 7. Explain the AWS electrode nomenclature
 8. Determine proper electrode for given joint based on material and position of weld
 9. Determine proper type of electrodes to be used in a variety of industry applications
 10. Identify proper electrode storage and handling
 11. Identify consumables
- C. Demonstrate proper electrode selection and use based on metal types and thicknesses.
 12. Identify consumables for various electrode sizes
 13. Select the proper electrode type and size relative to metal size, type and thickness
 14. Select the proper electrode type and size based on material specifications
- D. Build pads of weld beads with selected electrodes in the Vertical position.
 15. Implement safety procedures and PPE
 16. Implement proper equipment setup
 17. Use the proper metal transfer
 18. Create a pad of beads using GMAW

19. Weld exhibits proper uniformity and profile
- E. Build pads of weld beads with selected electrodes in the Overhead position
20. Implement safety procedures and PPE
 21. Implement proper equipment setup
 22. Use the proper metal transfer
 23. Create a pad of beads using GMAW
 24. Weld exhibits proper uniformity and profile
- F. Produce basic GMAW welds on selected weld joints.
25. Implement safety procedures and PPE
 26. Implement proper equipment setup
 27. Perform fillet weld in Vertical position
 28. Perform a fillet weld in Ove head position
 29. Perform a groove weld in a Vertical position
 30. Perform a groove weld in an Overhead position
 31. Use tools appropriate for the task
- G. Conduct visual inspection of GMAW welds.
32. Identify common visual discontinuities and defects on welds
 33. Determine causes of discontinuities and defects of welds
 34. Inspect welds for pass/fail ratings according to industry standards
 35. Use appropriate tools for 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>.