

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	GMAW
COURSE NUMBER	WELD 0130
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 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 flat position; build pads of weld beads with selected electrodes in the horizontal 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. 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. GMAW Processes and equipment
 - A. GMAW equipment
 1. Welding station components
 2. Power sources
 3. Wire feeders
 4. Welding guns
 - B. GMAW process theory
 1. Machine settings
 2. Electrode specifications
 3. Metal transfer
 4. Shielding gasses
- II. GMAW welding in the flat position
 - A. Fillet welds (1F)
 - B. Groove welds (1G)
- III. GMAW welding in the horizontal position
 - A. Fillet welds (2F)
 - B. Groove welds (2G)
- IV. Weld inspection
 - A. GMAW visual inspection
 1. Visual inspection criteria
 2. Common discontinuities in flat and horizontal positions
 - B. GMAW 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 gas metal arc welding process (GMAW).
 1. Describe different modes of transfer
 2. Differentiate between types and uses of current
 3. Identify the advantages and disadvantages of GMAW
 4. Identify types of welding power sources
 5. Identify different components of a GMAW station
 6. Describe basic electrical safety

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

- C. Correlate GMAW electrode classifications with base metals and joint criteria.
 - 13. Explain the AWS electrode nomenclature
 - 14. Determine proper electrode 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
 - 16. Identify proper electrode storage and handling
 - 17. Identify consumables

- D. Demonstrate proper electrode selection and use based on metal types and thicknesses.
 - 18. Identify consumables for various electrode sizes
 - 19. Select the proper electrode type and size relative to metal size, type and thickness
 - 20. Select the proper electrode type and size based on material specifications

- E. Build pads of weld beads with selected electrodes in the flat position.
 - 21. Implement safety procedures and PPE
 - 22. Implement proper equipment setup
 - 23. Use the proper metal transfer
 - 24. Create a pad of beads using GMAW
 - 25. Weld exhibits proper uniformity and profile

- F. Build pads of weld beads with selected electrodes in the horizontal position.
 - 26. Implement safety procedures and PPE
 - 27. Implement proper equipment setup
 - 28. Use the proper metal transfer
 - 29. Create a pad of beads using GMAW
 - 30. Weld exhibits proper uniformity and profile

- G. Produce basic GMAW welds on selected weld joints.
 - 31. Implement safety procedures and PPE
 - 32. Implement proper equipment setup
 - 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. Conduct visual inspection of GMAW 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 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>.