SYLLABUS

DATE OF LAST REVIEW: 02/2013
CIP CODE: 48.0508
SEMESTER: Departmental Syllabus
COURSE TITLE: GTAW
COURSE NUMBER: WELD0140
CREDIT HOURS: 3
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITES: WELD0100

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, www.kckccbookstore.com, for the required texts for your particular class.

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 setup 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.

METHOD OF INSTRUCTION:
A variety of instructional methods may be used depending on content area. These may 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

EXPECTED LEARNER OUTCOMES:
Upon successful completion of this course:
A. The student will be able to Explain the gas tungsten arc welding process (GTAW)
B. The student will be able to Demonstrate the safe and correct set up of the GTAW workstation
C. The student will be able to Relate GTAW electrode and filler metal classifications with base metals and joint criteria
D. The student will be able to Build proper electrode and filler metal selection and use based on metal types and thicknesses
E. The student will be able to Build pads of weld beads with selected electrodes and filler material in the flat position
F. The student will be able to Build pads of weld beads with selected electrodes and filler material in the horizontal position
G. The student will be able to Perform basic GTAW welds on selected weld joints
H. The student will be able to Perform visual inspection of GTAW welds

COURSE COMPETENCIES:
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

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

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

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

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

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

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
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 LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome at any time.

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