

Bossier Parish Community College
Master Syllabus

Course Prefix and Number: WELD 107

Credit Hours: 4-3-3

Course Title: Advanced Flux Core and Gas Metal Arc Welding (FCAW and GMAW)

Course Prerequisites: READ 099; MATH 098; WELD 101 OR Previous weld training or welding experience.

Textbook: Modern Welding Common Cartridge - ISBN 978-1-63563-888-2: 12th edition, Goodheart Wilcox Publisher.

Course Description: Covers the knowledge, skills, and abilities required of an AWS Level II Advanced Welder for flux-core arc welding (FCAW) and gas metal arc welding (GMAW) including welding safety, welding theory, welding equipment set-up, structural and pipe layout, weld joint fit-up, welding codes and standards, qualification, certification, welding inspection and testing.

Learning Outcomes:

At the end of this course, the student will or will be able to:

- A. Demonstrate knowledge of occupational orientation skills
- B. Demonstrate a fundamental knowledge of layout and fit-up principles
- C. Understand documents governing welding and welding inspection
- D. Understand basic principles of welding metallurgy
- E. Understand welding inspection and testing principles
- F. Recognize the principles of and demonstrate the ability to use gas tungsten arc welding (GTAW)

To achieve the learning outcomes, the student will or will be able to:

(The letter designations at the end of each statement refer to the learning outcome(s).)

1. Follow safe practices. (A)
2. Prepare time or job cards, reports or records. (A)
3. Perform housekeeping duties. (A)
4. Follow verbal instructions to complete work assignments. (A)
5. Follow written details to complete work assignments. (A)
6. Follow safe operating procedures. (B)
7. Select shop equipment. (B)
8. Set up shop equipment. (B)
9. Operate shop equipment. (B)
10. Operate lifting equipment. (B)
11. Layout parts using advanced measurement practices. (B)
12. Follow safe handling procedures. (B)
13. Select layout tools. (B)
14. Interpret drawing, sketch or specification information. (B)

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15. Prepare work area for layout. (B)
16. Prepare material lists. (B)
17. Select material. (B)
18. Layout material. (B)
19. Perform bending or forming operations. (B)
20. Perform drilling or boring operations. (B)
21. Perform shearing operations. (B)
22. Perform oxyfuel gas cutting, beveling and piercing operations. (B)
23. Perform arc cutting, beveling and piercing operations. (B)
24. Fit-up parts or assemblies. (B)
25. Locate essential welding information from a code or other standard. (C)
26. Locate essential information for welding procedure and performance qualification. (C)
27. Recognize fundamental principles related to welding metallurgy. (D)
28. Recognize fundamental principles related to the properties of metals. (D)
29. Recognize fundamental principles related to residual stress and distortion. (D)
30. Recognize the role of welding inspection and testing in industry. (E)
31. Examine cut surfaces and edges of prepared base metal parts. (E)
32. Examine tack, intermediate layers, and completed welds. (E)
33. Perform safety inspections of equipment and accessories.
34. Make minor external repairs to equipment and accessories.
35. Set up for gas metal arc welding operations on carbon steel.
36. Operate gas metal arc welding equipment.
37. Execute corrective actions to repair surface flaws on welds and base metals.
38. Make fillet welds utilizing spray transfer mode in all positions on aluminum plate.
39. Make groove welds utilizing spray transfer mode in all positions on aluminum plate.
40. Perform an all position workmanship qualification test utilizing spray transfer mode on aluminum plate.
41. Make fillet welds in the 2F position, on carbon steel pipe using spray transfer. Short circuit transfer.
42. Make fillet welds, all positions, on carbon steel pipe, using short circuiting transfer.
43. Make 2G and 5G groove welds, on carbon steel pipe, using short circuiting transfer.
44. Perform a combination workmanship qualification test utilizing short circuit and spray transfer modes on carbon steel pipe & plate.
45. Set up for flux cored arc welding operations on carbon steel.
46. Operate flux cored arc welding equipment.
47. Execute corrective actions to repair surface flaws on welds and base metals.
48. Make fillet welds, all positions, on carbon steel pipe using self-shielded electrodes.
49. Make 2G and 5G groove welds, on carbon steel pipe using self-shielded electrodes.
50. Make fillet welds, all positions on carbon steel pipe, using gas-shielded electrodes.
51. Make 2G and 5G groove welds on carbon steel pipe, using gas-shielded electrodes.
52. Perform a combination workmanship qualification test utilizing self-shield and gas shielded electrodes on carbon steel pipe & plate.

Course Requirements: Complete all homework assignments, in-class equipment exercises, in class tests, and final exam.

Course Grading Scale:

90–100 = A

80–89 = B

70–79 = C

60–69 = D

0 – 59 = F

Attendance Policy: The college attendance policy is available at <http://www.bpcc.edu/catalog/current/academicpolicies.html>

Course Fees: This course is accompanied with an additional non-refundable fee for supplemental materials, laboratory supplies, software licenses, certification exams and/or clinical fees.

Nondiscrimination Statement: Bossier Parish Community College does not discriminate on the basis of race, color, national origin, gender, age, religion, qualified disability, marital status, veteran's status, or sexual orientation in admission to its programs, services, or activities, in access to them, in treatment of individuals, or in any aspect of its operations. Bossier Parish Community College does not discriminate in its hiring or employment practices.

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