

**Bossier Parish Community College**  
**Master Syllabus**

**Course Prefix and Number:** WELD 104

**Credit Hours:** 4-3-3

**Course Title:** Advanced Welding I

**Course Prerequisites:** READ 099; MATH 097; Prior Welding experience and/or education is required; Instructor Permission required

**Textbook:** NONE

**Course Description:** This course covers the knowledge, skills, and abilities required of an AWS Certified Level II Advanced Welder including welding safety, equipment, proper measurement for layout tool procedures, welding codes and standards for inspection, welding metallurgy, and welding principles for shielded metal arc welding, gas metal arc welding, flux cored arc welding, and gas tungsten arc welding.

**Learning Outcomes:**

At the end of this course, the student will:

- A. demonstrate knowledge of occupational orientation skills including: safe practices, preparation of job reports, and follow verbal and written instructions to complete work assignments;
- B. demonstrate a fundamental knowledge of the equipment used including following the appropriate safety procedures and using proper measurement for layout tools, procedures, and geometric construction;
- C. demonstrate a fundamental understanding of the documents governing welding and welding inspection including welding codes, standards, qualifications, and certifications;
- D. recognize the fundamental principles related to welding metallurgy, properties of metals, and residual stress and distortion;
- E. recognize the role of welding and inspection and testing in industry by using visual examination principles and practices; and
- F. demonstrate the ability to use arc welding principles and practices including: shielded metal arc welding (SMAW), gas metal arc welding (GMAW, GMAW-S), flux cored arc welding (FCAW-S, FCAW-G), and 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 safe operating procedures with shop equipment; (B)
- 6. select appropriate shop equipment for various tasks; (B)
- 7. set up and operate shop equipment for various tasks; (B)

8. operate lifting equipment; (B)
9. layout parts using advanced measurement practices; (B)
10. follow safe handling procedures with layout tools for geometric construction; (B)
11. select appropriate layout tools for geometric construction; (B)
12. interpret drawing, sketch or specification information with regard to layout principles and practices; (B)
13. select and prepare work area and materials for layout; (B)
14. perform bending or forming operations; (B)
15. perform drilling or boring operations; (B)
16. perform shearing operations; (B)
17. perform oxyfuel gas cutting, beveling, and piercing operations; (B)
18. perform arc cutting, beveling, and piercing operations; (B)
19. demonstrate knowledge of fitup parts or assemblies principles and practices; (B)
20. locate essential welding information from a code or other standard; (C)
21. locate essential information for welding procedure and performance qualifications; (C)
22. recognize fundamental principles related to welding metallurgy; (D)
23. recognize fundamental principles related to the properties of metals; (D)
24. recognize fundamental principles related to residual stress and distortion; (D)
25. recognize the role of welding inspection and testing in industry; (E)
26. examine cut surfaces and edges of prepared base metal parts; (E)
27. examine tack, intermediate layers, and completed welds; (E)
28. perform safety inspections of equipment and accessories; (F)
29. make minor external repairs to equipment and accessories; (F)
30. set up for shielded metal arc welding operations; (F)
31. operate shielded metal arc welding equipment; (F)
32. execute corrective actions to repair surface flaws on welds and base metals; (F)
33. make fillet welds, all positions, on carbon steel or stainless steel plate using stainless steel electrodes; (F)
34. make groove welds, all positions, on carbon steel or stainless steel plate using stainless steel electrodes; (F)
35. perform an all position workmanship qualification test on carbon steel or stainless steel plate using stainless steel electrodes; (F)
36. make fillet welds, all positions, on carbon steel pipe; (F)
37. make 2G, 5G, and 6G groove welds, on carbon steel pipe; (F)
38. perform a 6G unlimited thickness qualification test on carbon steel pipe; (F)
39. set up for gas metal arc welding operations on carbon steel; (F)
40. operate gas metal arc welding equipment; (F)
41. make fillet welds, all positions, on aluminum plate; (F)
42. make groove welds, all positions, on aluminum plate; (F)
43. perform an all position workmanship qualification test on aluminum plate; (F)
44. make fillet welds in the 2F position, on carbon steel pipe using spray transfer; (F)
45. make fillet welds, all positions, on carbon steel pipe, using short circuiting transfer; (F)
46. make 2G and 5G groove welds, on carbon steel pipe, using short circuiting transfer; (F)

47. perform a combination workmanship qualification test on carbon steel pipe and plate; (F)
48. set up for flux cored arc welding operations on carbon steel; (F)
49. operate flux cored arc welding equipment; (F)
50. make fillet welds, all positions, on carbon steel pipe, using self-shielded electrodes; (F)
51. make 2G and 5G groove welds, on carbon steel pipe, using self-shielded electrodes; (F)
52. perform a combination workmanship qualification test on carbon steel pipe and plate; (F)
53. set up for gas tungsten arc welding operation on carbon steel, aluminum, and stainless steel; (F)
54. operate gas tungsten arc welding equipment; (F)
55. make 3F and 4F fillet welds, on aluminum sheet; (F)
56. Make 2G-4G groove welds on aluminum sheet; (F)
57. make 4F fillet welds on stainless steel sheet; (F)
58. make 3G-4G groove welds on stainless steel sheet; (F)
59. make fillet welds, all positions, on carbon steel round tubing; (F)
60. make fillet welds, all positions, on aluminum round tubing; (F)
61. make fillet welds, all positions, on stainless round tubing; (F)
62. make 2G and 5G groove welds on carbon steel round tubing; (F)
63. make 2G and 5G groove welds on aluminum round tubing; (F)
64. make 2G and 5G groove welds on stainless steel round tubing; (F)
65. perform combination workmanship qualification tests on carbon steel round tubing and sheet; (F)
66. perform combination workmanship qualification tests on aluminum round tubing and sheet; (F) and
67. perform combination workmanship qualification tests on stainless steel round tubing and sheet (F)

**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.bpsc.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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