

Bossier Parish Community College  
Master Syllabus

**Course Prefix and Number:** AMFG 102

**Credit hours:** 3-2-1

**Course Title:** Tools and Equipment Used in Manufacturing

**Course Prerequisites:** MATH 098

**Textbook(s):** None

**Course Description:** Provides an introduction to math, measurements, schematics, drawings, and prints used in manufacturing. Facilitates application of these skills to safely and correctly use hand tools, power tools, hydraulic systems, and pneumatic systems.

**Learning Outcomes:**

At the end of the course, the student will:

- A. show knowledge of basic math, demonstrate safe and correct usage of measuring devices in manufacturing and identify how symbols are used in drawings, including prints and schematics;
- B. state the importance of workplace safety and hazards programs, explain why OSHA and other regulatory organizations are vital to industrial safety, and demonstrate proper implementation of safety programs in the workplace;
- C. demonstrate safe and correct usage of hand tools and power tools;
- D. identify the basic components of a hydraulic system using a schematic, illustrate practical applications and maintenance procedures for hydraulic systems, and analyze hydraulic system problems; and
- E. identify the basic components of a pneumatic system using a schematic, demonstrate the ability to assemble the basic components of a pneumatic system, and analyze pneumatic system problems.

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. show competence with basic addition, subtraction, multiplication and division; (A)
2. show competence in mathematical operations using decimals; (A)
3. show competence in mathematical operations using fractions; (A)
4. show competence in mathematical operations converting fractions to decimals; (A)
5. discuss the mathematical operations required to convert English to Metric and Metric to English measurement in length, weight and volume problems; (A)
6. use analog, digital and vernier measuring devices to measure length, thickness and depth; (A)
7. use electrical measuring devices to measure voltage, amperage, resistance, conductance, wattage, etc.; (A)
8. identify the drawing date, revision level etc. of a drawing or print; (A)
9. determine the linear, angular and radii tolerances of parts from the drawing; (A)
10. identify various types of pumps; (A)

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11. identify various safety components of a hydraulic system; (A)
12. identify various types of actuators (rotary and linear); (A)
13. name component symbols used on hydraulic, pneumatic, and electrical schematics (A)
14. explain the basic flow path of a hydraulic system; (A)
15. discuss the concept of education preventing accidents; (B)
16. explain how eliminating hazards will result in a safer work environment; (B)
17. show how proper use of PPE can protect the worker from workplace hazards; (B)
18. discuss how safety programs can prevent injuries based on long time exposure to hazards. (i.e.hearing protection, chemical exposure, welding fumes, ergonomic issues, etc.); (B)
19. discuss how OSHA acts to investigate complaints to protect workers from known hazards; (B)
20. discuss the development of a safety program to ensure it meets OSHA, state and federal requirements and the company environment; (B)
21. describe the documentation and visual controls that must be developed to implement the safety program; (B)
22. demonstrate safe and correct usage of hand tools; (C)
23. describe the purpose and use of GFCIs; (C)
24. describe the purpose and importance of proper tool grounding; (C)
25. demonstrate safe and correct usage of hand held power tools; (C)
26. describe the steps required to maintain the hoses and tubing carrying oil to cylinders and pistons; (D)
27. demonstrate ability to observe the oil for contamination or debris, inspect the filters then replace the filters as needed; (D)
28. identify various types of compressors; (E)
29. identify various safety components of a pneumatic system; (E)
30. identify various types of regulators/compensators; (E)
31. identify various types of actuators (rotary and linear); (E)
32. draw a flow diagram naming the basic components of a pneumatic system; (E)
33. explain the basic flow path of a pneumatic system; (E)
34. identify tools required to perform maintenance on a pneumatic system; (E)
35. connect the components of a pneumatic system with approved tools, tubing and fittings; (E) and
36. demonstrate the ability to identify and close the correct valves to isolate components when troubleshooting pneumatic system problems. (E)

**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://catalog.bpcc.edu/content.php?catoid=5&navoid=369>

**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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