

Bossier Parish Community College
Master Syllabus

Course Prefix and Number: AMFG 106

Credit hours: 3-2-3

Course Title: Introduction to Fabrication, Process Technology and Machining

Course Prerequisites: MATH 097

Textbook(s): None

Course Description: Presents an introductory knowledge of fabrication, process technology and machining. Offers hands on experience in each area.

Learning Outcomes:

At the end of the course, the student will:

- A. apply and understand OSHA regulations and practices to perform work tasks safely;
- B. apply basic algebra and geometry as required to achieve work objectives, demonstrate how to select, read, and care for precision measuring tools and gauges, and identify and select stock materials as required from technical drawings;
- C. demonstrate an understanding of the major groups of metal types and their usage, identify and select structural metal shapes and metal plates from technical drawings, illustrate common techniques used to cut metal shapes and plates in preparation for assembly, and illustrate how to use common equipment and tools to contour, bend, notch, punch, or drill structural metal shapes and plates;
- D. illustrate how common welding techniques, equipment, and tools are used to join metal shapes and plates, demonstrate the ability to assemble and inspect basic metal assemblies and sub-assemblies for accuracy and quality, and demonstrate knowledge of basic chemistry principles required to meet process technology work goals; and
- E. demonstrate knowledge of basic physics principles required to meet process technology work goals, explain the history of process technology and its terminology and explain the function of process technology equipment and tools, show how to operate basic process controls and explain common machining techniques used in precision machining.

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. use proper safety procedures connected with electrical safety, walking and working surfaces, exit routes, emergency action plans, fire prevention plans, fire protection, flammable and combustible liquids, machine guarding, PPE, hazard communication, and blood-borne pathogens; (A)
- 2. demonstrate the ability to identify the types of precision measuring tools and gauges used in machining and their purpose; (B)
- 3. demonstrate the ability to use inside and outside calipers; (B)
- 4. demonstrate the ability to use analog and digital calipers; (B)
- 5. demonstrate the ability to use Outside Diameter (OD), Inside Diameter (ID) and

- depth micrometers; (B)
6. demonstrate the ability to use dial indicators; (B)
 7. demonstrate the ability to use height gauges; (B)
 8. demonstrate the ability to understand the terms used to identify materials used in machining; (B)
 9. demonstrate the ability to understand the sizing of materials to be machined; (B)
 10. demonstrate an understanding of the types of metals used in machining and their purpose; (B)
 11. distinguish the difference between ferrous and nonferrous metals; (C)
 12. explain the different metal types and their usage in industry; (C)
 13. explain the general properties of the major metals used in industry (Steel, Aluminum, stainless Steel, etc.); (C)
 14. recognize different types of materials by weight and visual inspection; (C)
 15. recognize and understand how symbols and notes are used to identify common steel shapes on technical drawings; (C)
 16. recognize common metal shapes by geometric profile (W-beams, Angles, T-beams, etc.); (C)
 17. recognize and understand how symbols and notes are used to identify common metal plates and sheet metal on technical drawings; (C)
 18. explain the correlation between metal thickness and common gauge and plate standards; (C)
 19. demonstrate Oxy-fuel and plasma torch cutting; (C)
 20. explain the use of various types of saws; (C)
 21. explain the use of various types of shears; (C)
 22. explain the use of various types of Numerical Control (NC)/ Computerized Numerical Control (CNC) machines (plasma, laser, water-jet, etc.) used to cut profiles from stock materials; (C)
 23. illustrate the use of various types presses to bend or punch holes in profiles; (C)
 24. illustrate the use of various types of vertical and horizontal drill presses and boring machines to place holes in profiled plates and structural members; (C)
 25. demonstrate the use of various types saws used to profile plates and shapes; (C)
 26. demonstrate the general use and equipment for stick-electrode, Gas Metal Arc Welding (GMAW), and Tungsten Inert Gas (TIG) for joining metals; (D)
 27. demonstrate the usage of technical drawings, technical instructions, and measuring tools to assemble a pre-defined component to an acceptable state; (D)
 28. assemble and disassemble a simple assembly using standard operating procedures (SOP); (D)
 29. describe the basic properties of common chemicals used and produced in processing plants; (D)
 30. describe what acids and bases are, and the hazards of each; (D)
 31. describe the basic principles of pressure; (E)
 32. describe the basic principles of temperature and how it relates to pressure; (E)
 33. examine the basics of fluid flow and how it relates to process equipment; (E)
 34. explain the purpose and function of basic hand tools; (E)
 35. explain the purpose and function of piping and valves; (E)
 36. explain the purpose and function of pumps and compressors; (E)

37. explain the purpose and function of furnaces and boilers; (E)
38. explain the purpose and function of heat exchangers and cooling towers; (E)
39. explain the purpose and function of safety and relief valves; (E)
40. illustrate what Process Flow Diagrams (PFDs) and Piping and Instrumentation Diagrams (P&IDs) are and their symbols; (E)
41. discuss the differences between set points and process variables; (E)
42. explain the purpose and function of basic process instrumentation; (E)
43. explain the purpose and function of a basic control loop and its equipment; (E)
44. demonstrate an understanding of machining terms; (E)
45. demonstrate an understanding of drilling and its purpose; (E)
46. demonstrate an understanding of milling and its purpose; (E)
47. demonstrate an understanding of turning and its purpose, including live center and dead center turning; (E)
48. demonstrate an understanding of reaming and its purpose; (E)
49. demonstrate an understanding of grinding and its purpose; (E) and
50. demonstrate an understanding of the differences between CNC machining and manual machining. (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://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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