



BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MATT1310 Machining Theory and Methods
3 Semester Credit Hours

Student Learning Outcomes and Enabling Objectives

1. Demonstrate proficiency around the safety concepts of Machining Theory and Methods in manufacturing.
 - a. Ensure Safe operating practices of machining methods, equipment and personnel.
 - b. Understand the safe use of equipment during machining methods.
 - c. Demonstrate safe operation of machine tools in a professional and appropriate manner
 - d. Identify and Understand what Personal Protective Equipment is required for each task
 - i. Safety glasses
 - ii. Gloves
 - iii. Hearing protection
 - iv. Foot wear
 - v. Hard hat
 - vi. Clothing
2. Demonstrate efficiency in basic machine shop set to include the following in a professional and appropriate manner.
 - a. Human factors
 - b. Tools needed
 - c. Marking, measuring and layout
 - d. Mathematics needed
3. Develop a basic understanding of different types of Metals and Alloys
 - a. Common carbon steel sizes and shapes
 - b. Carbon steel finishes
 - c. Steel numbering system
 - d. Principal steel categories
 - e. Pipes and tubes
 - f. Special steel products, stainless steels and aluminum
4. Analyze and differentiate types of Oils and Hardness testing used in fabricating processes.
 - a. Metal hardness testing
 - b. Lubricating oils, motor oils and cutting fluids
 - c. Metal characteristics

5. Demonstrate the ability to determine the functions of Tapers, Dowel Pins, Fasteners and Key Concepts
 - a. Tapers
 - b. Threaded fasteners
 - c. Dowel pins versus tapered pins
 - d. Important machining concepts

6. Demonstrate the proper Filing methods and grinding applications.
 - a. Filing basics, designs and practices
 - b. Bench and pedestal grinders
 - c. Disc and belt grinders
 - d. Die and pencil grinders
 - e. Surface and Blanchard grinders

7. Understand the various applications of Drilling, Reaming and Tapping.
 - a. Twist drills
 - b. Drill chucks and drill press operations
 - c. Reaming
 - d. Tapping

8. Demonstrate proficiency in the use of Band saws
 - a. Types of band saws
 - b. Work holding
 - c. Feeds

9. Exhibit proper operations of Lathes functions to successfully machine the details of a hammer as described on the given blueprint.
 - a. Lathe design, set up and tooling
 - b. Quick change tool post systems
 - c. Cutting tools and chucks
 - d. Knurling
 - e. Work holding
 - f. Speeds and feeds

10. Exhibit proper operations of Milling Machine functions to accurately build two 1-2-3 blocks
 - a. Milling machine design
 - b. Setting up a milling machine
 - c. Measuring and locating
 - d. Clamping and work holding
 - e. End mills, face mills and fly cutters
 - f. Drilling and boring
 - g. Speeds and feeds

11. Analyze and identify the effects of proper Machine Shop Problem Solving
 - a. Repair methods
 - b. Shop made or modified tools
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Big Ideas and Essential Questions

Big Ideas

- Industrial Safety Foundations of Machining Theory and Methods
- Basic Principles of Machining Theory and Methods
- Understanding the Mathematics Machining Theory and Methods
- Proficiency in the use of Milling machines, Lathes and Grinders
- Fundamental understanding of the different types of cutting tools in machining

Essential Questions

1. Why is safety the first priority?
 2. How does proper Machining theory and methods insure product conformance?
 3. Why is it important to consider efficient and accurate machining methods?
 4. How do I determine what machining process to use to accomplish the desired finished product items?
 5. What impact does an incorrect usage have on machine reliability?
 6. How are the different machining processes used?
 7. How does documentation affect industrial communication between shifts?
 8. What are the potential uses in the future?
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These SLOs are not approved for experiential credit.

Effective: Summer 2021