

ATMT-2120: MACHINE OPERATIONS II

Cuyahoga Community College

Viewing: ATMT-2120 : Machine Operations II

Board of Trustees:

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Academic Term:

Spring 2019

Subject Code

ATMT - Appd Ind Tech-ManufacturingTec

Course Number:

2120

Title:

Machine Operations II

Catalog Description:

Theory and application of use of engine lathe, planning machines, milling machines, grinders, quality control, metallurgy, and fasteners. Emphasis on use of typical equipment found in conventional machine shop. Extensive hands-on projects.

Credit Hour(s):

6

Lecture Hour(s):

1

Lab Hour(s):

15

Requisites

Prerequisite and Corequisite

ATMT-1120 Machine Operations I.

Outcomes

Course Outcome(s):

N/A

Objective(s):

1. Demonstrate operation of lathes with proper set up.
2. Demonstrate operation of milling machines with proper set up.
3. Demonstrate operation of grinders and band saws with proper set up.
4. Identify and describe basic quality control techniques.
5. Demonstrate methods of assuring quality.
6. Recognize and demonstrate non-destructive testing methods.

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom Participation
4. Demonstration of project assignments in laboratory setting.

Course Content Outline:

1. Engine lathe
 - a. Lathe size
 - b. Major parts
 - c. Holding and rotating the work
 - d. Cleaning
 - e. Cutting tools
 - f. Speeds and feeds
 - g. Turning work between centers
 - h. Work holding attachments
 - i. Checking center alignment
 - j. Turning to a shoulder
 - k. Lathe chucks
 - l. Installing lathe chucks
 - m. Parting operations
 - n. Taper turning
 - o. Calculating tailstock setover
 - p. Taper attachments
 - q. Cutting screw threads
 - r. Boring
 - s. Knurling
 - t. Mandrels
2. Planing machines
 - a. Shapers
 - b. Shaper size
 - c. Mounting work
 - d. Planers
 - e. Broaching
3. Milling machines
 - a. Types of milling machines
 - b. Milling operations
 - c. Safety practices
 - d. Cutters
 - e. Methods of milling
 - f. Holding and driving cutters
 - g. Cutting fluids
 - h. Speeds and feeds
 - i. Holding attachments
 - j. Index tables
 - k. Dividing heads
 - l. Machining angular surfaces
 - m. Machining internal openings
 - n. Milling and boring
 - o. Edge finders
 - p. Care of machines
 - q. Face milling
 - r. Side milling
4. Precision grinding
 - a. Types
 - b. Work holding devices
 - c. Grinding wheels
 - d. Dressing tools
 - e. Mounting a grinding wheel
 - f. Cutting fluids
 - g. Applications
 - h. Grinding problems
 - i. Sharpening cutters (tooth rest, brackets)

- j. Indexing
- k. Cylindrical
- l. Form
- m. Internal / external / centerless
- n. CNC controlled
- o. Electrolytic
- p. Other grinding techniques
- 5. Safety
 - a. Band machining
 - b. Blade selection
 - c. Blade type
 - d. Blade characteristics
 - e. Welding blades
 - f. Preparing a blade to be welded
 - g. Band machine lubrication
 - h. Band guides
 - i. Blade tension
 - j. Blade tracking
 - k. Cutting speeds
 - l. Machining operations
 - m. Power feed
 - n. Troubleshooting
 - o. Friction sawing
 - p. Quality control
 - q. Destructive/nondestructive testing
 - r. Measuring
 - s. Spot checking
 - t. Other quality control techniques
- 6. Fasteners
 - a. Thread
 - b. Screw
 - c. Bolts
 - d. Forming screws
 - e. Nuts
 - f. Washers
 - g. Dowel pins
 - h. Rivets
 - i. Keys
 - j. Retaining rings
 - k. Adhesives
- 7. Heat treatment of metals (metallurgy)
 - a. Stress relieving
 - b. Annealing
 - c. Quenching
 - d. Case hardening
 - e. Normalizing
 - f. Carburizing
 - g. Surface hardening / flame hardening / induction hardening
 - h. Equipment
 - i. Quenching media
 - j. Heat treatment of other metals
 - k. Tempering
 - l. Hardness testing

Resources

Krar, Steve and Check Albert. *Technology of Machine Tools*. Westerville: Glencoe/McGraw-Hill, 1997.

Walker, John. *Machining Fundamentals*. South Holland: Goodheart-Wilcox, 1993.

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