

I. COURSE DESCRIPTION

- A. Department Information:
Division: Technical
Department: Machine Trades
Course ID: MACH 021B
Course Title: Machine Shop I
Units: 4
Lecture 2 hours
Laboratory: 6 hours
Prerequisite: None
Departmental Advisory: MACH 120A
- B. Catalog and Schedule Description:
First semester machine shop practices for majors or non-majors, with emphasis on Occupational Safety Health Association (OSHA), shop mathematics, measurements, and the correct use of the basic machine tools, mills, lathes, saws, and drill presses, as well as an introduction to National Industry Metal Working Standards (NIMS) skill standards.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of the course, the student will be able to:

- A. Apply safety in the machine shop area utilizing OSHA standards.
- B. Utilize machine tools in a safe manner.
- C. Accurately hold tolerances to a given print drawing.
- D. Properly maintain equipment to industry specifications.

IV. COURSE CONTENT:

- A. OSHA Standards
 - 1. General safety
 - 2. Identify shop hazards
 - 3. OSHA (Occupational Safety Health Act) standards
- B. Basic Machine Tools
 - 1. Drilling, turning machines, milling machine operation, and sawing
 - 2. Tool holders and accessories for the lathe and mill
 - 3. Machine controls, digital readouts
- C. Dimensional Measurement
 - 1. Mathematics review on measurement
 - 2. Systems measurement
 - 3. Measurement tool usage
 - 4. Layout process to NIMS standards
- D. Blueprints
 - 1. Shop prints for mill and lathe operations
 - 2. Tolerancing to meet ISO 9000 standards
 - 3. Geometric tolerancing symbols
 - 4. National Industry Metal Working Skill tolerance requirements

V. METHODS OF INSTRUCTION:

- A. Lecture
- B. Machine tool demonstrations
- C. Interactive computer instruction
- D. Field trips

VI. TYPICAL ASSIGNMENTS:

- A. Interactive computer programs for measurement and machine processes
- B. Complete machine tool safety questionnaire, answering questions at 100% accuracy
- C. Read measuring tools, micrometers, verniers, indicators, and calipers to 100% accuracy
- D. Utilizing a 0 – 1-inch micrometer, identify the diameters on the given part

VII. EVALUATION(S):

- A. Methods of Evaluation:
 - 1. Lathe/mill projects
 - 2. Oral/written test
 - Typical Questions:
 - a) Identify five parts on a typical engine lathe.
 - b) What lathe tool is used to enlarge a hole?
 - 3. Final exam/project
- B. Frequency of Evaluation:
 - 1. Five (5) lathe projects
 - 2. Five (5) mill projects
 - 3. Three (3) written tests
 - 4. One (1) final exam
 - 5. One (1) final project

VIII. TYPICAL TEXT(S):

- Walker, John, Machining Fundamentals, 6th Edition, Tinley Park, IL, The Goodheart Wilcox Company, Inc., 2004
- Walker, John, Machining Fundamentals Workbook, 6th Edition, Tinley Park, IL, The Goodheart Wilcox Company, Inc., 2004
- Hoffman, Edward G., Student Shop Reference Book, 3rd Edition, Madison Avenue, NY, Industrial Press, 2003

IX. OTHER SUPPLIES REQUIRED OF STUDENT:

- Safety glasses, lock

**Content Review Form
 DEPARTMENTAL ADVISORY COURSE**

Target Course: MACH 021B Machine Shop I

Departmental Advisory Course: MACH 120A Machine Shop Theory

Instructions:

1. List exit competencies (skills) from the Departmental Advisory Course. These skills are listed in the "Student Outcomes" section of the Course Outline.
2. Indicate which of the listed exit competencies (skills) are necessary entry skills probably needed for success in the target course. Mark with an "X" each needed skill.
3. Indicate the degree of importance of each identified entry skill for course success, using the following rating scale:
 1 = Critical 2 = Very Helpful 3 = Desirable

Skills Analysis

Entry Skills in Target Course	Exit Skills provided by advisory course (mark with an X if needed and indicate advisory course if more than one).	Degree of Importance (Rate 1 – 3)
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| 1. | Demonstrate their knowledge of safe machine operating practices, saws, mills, drills, and precision grinders. | X | 2 |
| 2. | Demonstrate their uses of speed and feed tables. | X | 2 |
| 3. | Demonstrate their uses of precision measuring tools. | X | 2 |
| 4. | Demonstrate their knowledge of manufacturing materials and processes. | X | 2 |