

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Precision Machining & Automation Technology Program
Revision Date: August 22, 2022

I. CATALOG DESCRIPTION

Course Number: MACH1226
Course Title: Precision Machine Lab II
Prerequisite(s): MACH1175
Catalog Description: Practice using machine tools. Drill press, lathe, milling machine, surface grinder and cylindrical grinder.
Credit Hours: 3.5
Class Hours: 15
Lab Hours: 112.5
Total Contact Hours: 127.5

II. COURSE OBJECTIVES: *Course will:*

- A. Develop proficiency on such machine tools as the drill press, lathe, milling machine surface grinder and cylindrical grinder.
- B. Apply the classroom theory to help solve routine problems on daily lab projects.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Calculate proper speeds and feed for all machining operations.
 - 2. Single point thread internal and external UN and Acme threads using lathe.
 - 3. Grind boring and threading tools to machine assigned projects.
 - 4. Set-up lathes to machine components between centers.
 - 5. Produce angles and tapers using both compound rest.
 - 6. Indicate a four jaw chuck on a lathe.
 - 7. Drill, ream, bore, tap, counterbore and countersink on a lathe.
 - 8. Precisely bore and position holes using a boring head and digital readout on vertical mill.
 - 9. End mill keyseats on shafts and broach keyseats in a bore.
 - 10. Position drilled holes and counterbore or countersink to proper depths.
 - 11. Operate surface grinder using magnetic chucks.
 - 12. Set-up and grind straight and on cylindrical grinder.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO 5: Analytical, Quantitative, and Scientific Reasoning
Outcome 1: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Students will complete assigned projects using the following machine tools.
 - 1. Lathe
 - a. Turning and boring with HSS & inserted carbide tooling
 - b. Single point threading both O.D. I.D.
 - c. Taper turning
 - 2. Mill
 - a. End, face & slot milling with HSS & inserted carbide tooling
 - b. Hole locating drilling, reaming, use of boring head for boring
 - 3. Drill Press

- a. Center drill, pilot drill, drill to size and location
 - b. Counterbore and countersink to depth
- 4. Grinders
 - a. Surface grinding parallel and angular surfaces
 - b. Cylindrical grinding both parallel

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): None
- B. Other Resources: 3 Ring Notebook, note taking materials and a Calculator
- C. Students will be assigned project prints that they will be required to complete.

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lecture
 - 2. Small and large group discussion
 - 3. Video presentation
 - 4. Demonstrations
 - 5. Project boards
 - 6. Internet resources
 - 7. Handouts
 - 8. Observations
 - 9. Assigned lab projects
 - 10. Field trips

VII. METHODS OF EVALUATION (*course outline will provide more detailed information*)

- A. Methods of evaluations, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Notebook (if required)
 - 2. Quizzes
 - 3. Tests
 - 4. Lab grades
 - 5. Class participation

VIII. SPECIFIC COURSE REQUIREMENTS

- A. Completion of all tests, projects, assignments, and notebook (if required).
- B. Please see the course outline for attendance regulations established by the instructor.
- C. Program shop safety rules will be followed. Please see the course outline for any additional safety rules established by the instructor.