

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Manufacturing Engineering Technology Program
Revision Date: August 2024

I. CATALOG DESCRIPTION

Course Number: MFGT2566
Course Title: Tooling Design
Prerequisite(s): PHYS1017 or PHYS1150, MFGT2559, MFGT2680
Catalog Description: Design and development steps for Tooling Design using parametric solid modeling techniques: machining fixtures, weld fixtures, drill jigs, robotic welding fixtures, and the piece part products of these various tools.

Credit Hours: 3
Class Hours: 15
Lab Hours: 90
Total Contact Hours: 105

II. COURSE OBJECTIVES: *Course will*

- A. Demonstrate how to envision, sketch, develop, design and document a jig or fixture for manufacturing.
- B. Design different tools for low cost, high quality and increased production.
- C. Design for proper use, proper materials for adequate and maximum safety of the operator.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to*
 - 1. Define terms used in tool design.
 - 2. Identify and define the principles of design economy.
 - 3. Analyze part data to determine suitable tool designs.
 - 4. Select locating, supporting, and clamping methods to suit specified sample parts.
 - 5. Create, research, design and draw a complete set of working drawings for various dies, molds, jigs and fixtures and the piece parts of these various tools.
 - 6. Apply GD & T principles to show critical relationships between parts.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #3: Critical Thinking & Problem Solving
Outcome 1: Synthesize information to arrive at reasoned solutions to problems.

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

- A. Basic types and functions of jigs and fixtures
- B. Considerations of design economics
- C. Designing and constructing jigs and fixtures
- D. Specialized work holding topics
- E. Production designs to utilize past learned skills based upon time allotted, varies with the complexity of each design.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 - 1. Hoffman, Edward, *Jig and Fixture Design* (current edition – see instructor)
 - 2. *Machinery's Handbook* (current edition – see instructor)
 - 3. Krulikowski, *The Ultimate GD&T Pocket Guide*, 2nd Edition

- B. Other Resources:
 - 1. USB 2.0 flash card of equivalent storage (4 GB suggested)
 - 2. Supplemental handouts supplied by instructor
 - 3. Notebook 8 ½” by 11” (100 pages minimum)

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. Flip charts
 - 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 evaluation typically include a combination of the following:
 - 1. Notebook (if required)
 - 2. Quizzes
 - 3. Tests
 - 4. Homework or daily assignments
 - 5. Lab grades
 - 6. Attendance/class conduct

VIII. SPECIFIC COURSE REQUIREMENTS:

- A. Completion of all tests, projects, assignments, and notebook (if required).
- B. Must earn a final grade of 60% (1.0) or higher.
- C. Program shop safety rules will be followed. **Please see the course outline for any additional safety rules established by the instructor.**