

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Electrical/Electromechanical Technology Program
Revision Date: August 26, 2019

I. CATALOG DESCRIPTION

Course Number: ELEC1337
Course Title: Sketching & CAD
Prerequisite(s): None
Catalog Description: Electromechanical students will learn the fundamentals of freehand sketching and computer based drafting for maintenance purposes.
Credit Hours: 2
Class Hours: 15
Lab Hours: 45
Total Contact Hours: 60

II. COURSE OBJECTIVES: *Course will:*

- A. Explain how to communicate mechanical ideas with the use of hand sketching.
- B. Demonstrate to the students how to use computer aided drafting.
- C. Illustrate methods used to represent electrical control and schematics using computer aided drafting.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes *Student will be able to:*
 - 1. Understand and draw Multiview mechanical drawings.
 - 2. Understand and dimension Multiview mechanical drawings.
 - 3. Demonstrate the use of drawing and modifying.
 - 4. Understand dimension tools and the use of layers on a computer aided drawing software.
 - 5. Draw electronic schematics utilizing layers on computer aided drafting software.
 - 6. Draw a ladder diagram with proper annotation utilizing layers on computer aided drafting software.
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #6: Career and Life Skills
Outcome 4: Use digital technology effectively to access, manage, integrate, evaluate, and present information.

IV. CONTENT/TOPICAL OUTLINE

- A. Principles of freehand sketching
 - 1. Proportions
 - 2. Techniques
- B. Lettering a sketch
 - 1. Spacing
 - 2. Height by function of composition
- C. Making multi-view sketches
 - 1. Orientation of object
 - 2. Spacing of lines
 - 3. Projection of curved surfaces
- D. Dimensioning sketches
 - 1. Indication of dimensions

- 2. Dimension arrangements
- 3. Limits & tolerances
- E.** Sketching sectional views
 - 1. Cutting plane line
 - 2. Types of sectional views
 - 3. Representing sectional views
 - 4. Conventional breaks
- F.** Sketching auxiliary views
 - 1. Types of auxiliary views
 - 2. Methods of sketching
- G.** Pictorial sketches
 - 1. Isometric
 - 2. Oblique
 - a. Cavalier
 - b. Cabinet
 - 3. 1 pt. Perspective
 - 4. 2 pt. Perspective
- H.** Fastening devices & methods
 - 1. Unified screw thread series
 - 2. Thread classes
 - 3. Designation
 - 4. Types of threaded fasteners
 - 5. Rivets
 - 6. Nails
 - 7. Washers & locking devices
 - 8. Welding symbols
- I.** AutoCAD Drawing Commands
 - 1. Line
 - 2. Circle
 - 3. Arc
 - 4. Text
 - 5. Donut
 - 6. Poly-line
 - 7. Part
- J.** AutoCAD Editing Commands
 - 1. Redraw
 - 2. Erase
 - 3. Scale
 - 4. Rotate
 - 5. Move
 - 6. Mirror
 - 7. Copy
 - 8. Break
- K.** AutoCAD Drawing Aids
 - 1. Grid
 - 2. Snap
 - 3. Ortho
 - 4. Layer
 - 5. Attach
 - 6. Zoom

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): Giachino, J.W., and Henry J. Beukema, *Freehand Sketching*, 2nd edition
- B. Supplies: HB pencil, F pencil, Eraser and one pad of ¼ inch square graph paper

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lecture
 - 2. Lab
 - 3. Homework

VII. METHODS OF EVALUATION

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Overall course grade shall consist of two tests and lab work completed.

VIII. SPECIFIC COURSE REQUIREMENTS

- A. A minimum grade of 60% is required.
- B. Cheating within the Manufacturing Division: Any violation of academic integrity on assignments, quizzes, or tests will result in a grade of 0 on that assignment, quiz, or test. A second violation in any course after the initial infraction will result in a grade of F for that course. Any additional violations while in the program will result in a suspension from the program.
- C. Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.