Last updated: 11/99

San Bernardino Valley College

Course Outline for ELECTR 155
ELECTRONIC DRAWING AND ASSEMBLY

I. CATALOG DESCRIPTION:
Department: Electricity/Electronics
ELECTR 155: Electronic Drawing and Assembly
2 hours lecture, 3 hours laboratory = 3 Units
Catalog Description: Skill in interpreting and creating electronic drawings, circuit board construction and assembly. Emphasis on drawings, soldering, assembly and fundamentals of CAD.
Schedule Description: Skill in interpreting and creating electronic drawings, circuit board construction and assembly. Emphasis on drawings, soldering, assembly and fundamentals of CAD.
Prerequisite/corequisite: None

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

III. EXPECTED OUTCOMES FOR STUDENTS:
Upon completion of the course, students will be able to:
A. Identify and draw electronics circuits using a graphics template, logic template, and a circle template.
B. Explain the purpose and function of the following:
   1. Block diagrams
   2. Control drawings
   3. Printed circuit boards
   4. Logic diagrams
   5. Schematic diagrams
   6. Interconnection diagrams
   7. Wiring diagrams
C. Lay out a simple block diagram showing conventional and auxiliary flow paths.
D. State the six fundamental rules for dimensioning.
E. Identify ten kinds of lines used on electronic and electromechanical drawings.
F. Identify the elements of computer-aided-drafting system.
G. Identify the differences in the three types of control drawings.
H. Identify component value information and component sequence numbers on schematic diagrams.
I. Identify the three standard integrated circuit packages.
J. Describe the characteristics of the point-to-point, highway, and tabular types of wiring diagrams.
K. Calculate the total developed length for parts with a 90-degree bend and greater than 90-degree bends.

IV. CONTENT:

A. Technical Graphics Practices
   1. Introduction
   2. Current practices
   3. Tools and equipment
   4. The drawing medium
   5. Lettering and drafting techniques
   6. The freehand sketch
   7. The projection drawing
   8. Dimensioning

B. The Electronic Component
   1. Purpose and function
   2. Types of electrical components
   3. Summary

C. The Block Diagram
   1. Purpose and function
   2. Graphic symbols
   3. Information flow
   4. Line convention
   5. Size and shape of blocks
   6. Lettering
   7. Method for drawing the block diagram

D. The Control Drawing
   1. Purpose and function
   2. Types of control drawings
   3. Drawing preparation

E. The Logic Diagram
   1. Purpose and function
   2. Types of logic diagrams
   3. Logic states
   4. Symbol presentation techniques
   5. Tagging lines
   6. Function identification letter combinations
   7. Signal flow
   8. Method for drawing the logic diagram

F. The Schematic Diagram
   1. Purpose and function
   2. Graphic symbols
   3. Conductor paths
   4. Reference designations
   5. Component values
   6. Method for drawing the schematic diagram

G. The Printed Circuit Board
   1. Purpose and function
   2. Types of PCBs
   3. The PCB component layout

4. PCB component layout review
5. The PCB artwork drawing
6. Artwork drawing review
7. The PCB drawing detail drawing
8. The PCB marketing drawing
9. The PCB assembly drawing

H. The Integrated Circuit
1. Types of ICs
2. Standard IC packages
3. IC design
4. Integrating the monolithic transistor

I. The Interconnection Diagram
1. Types of interconnection diagrams
2. Layout of the interconnection diagram
3. Method for drawing the interconnection diagram

J. The Connection Diagram
1. The wiring diagram
2. The cable assembly drawing
3. The wiring harness diagram

K. Electromechanical Packaging
1. Designer/drafter responsibilities
2. Types of equipment enclosures
3. Designing sheet metal parts
4. Fastening methods
5. The unthreaded fastener
6. Method for developing an electromechanical package

V. METHODS OF INSTRUCTION:
Methods of instruction will vary from instructor to instructor but may include:
A. Lecture
B. Videos and transparencies and class discussion
C. Filmstrips on drafting technique

VI. TYPICAL ASSIGNMENTS:
Typical assignments will vary from instructor to instructor but may include:
A. Lay out a simple block diagram showing conventional and auxiliary flow paths.
B. Draw electronics circuits using a graphics template, logic template, and a circle template.
C. Calculate the total developed length for parts with a 90-degree bend and greater than 90-degree bends.

VII. EVALUATION(S):
A. Methods of evaluation will vary from instructor to instructor but may include:
1. Quizzes
2. Twenty-five Assigned Drawings

B. Frequency of evaluation will vary from instructor to instructor but may include:

1. Quizzes
2. Final exam
   Typical Questions:
   a. Define “dimension”.
   b. Identify the three standard integrated circuit packages.

VIII. TYPICAL TEXT(S):
Maruggi. Technical Graphics: Electronic Work Text, 2nd Edition. Merrill Publishing, 1995.

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:
Drafting packet with appropriate tools