NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
CAD 175 SCHEMATICS AND MECHANICAL DIAGRAMS (2 CR.)

Course Description

Covers interpretation of basic shop drawings, conventional symbols, common electrical and electronics symbols, wiring diagrams, hydraulic and pneumatic symbols, schematic drawings, and piping diagrams. Lecture 2 hours per week.

General Course Purpose

This course is designed to teach students the basic concepts of electrical and mechanical symbols used in architectural plans, schematics, and control diagrams. Through this course, students will develop skillsets for troubleshooting and maintaining electro-mechanical systems.

Course Prerequisites/Corequisites

Prerequisite: None

Course Objectives

After the course, students will be able to classify and explain prints and drawings, identify electrical and mechanical symbols, analyze the function of control and circuit diagrams, develop troubleshooting skills, and design wiring and control diagrams for industrial control systems. Students will be able to:

- Explain the primary function of prints, drawings, and plans.
- List and explain the principles, techniques, and other common elements of drafting.
- Justify the purposes of construction dimensions.
- Interpret basic orthographic projection.
- Interpret basic geometric tolerancing standards.
- Differentiate countersinks and counterbores.
- Analyze the drawings of industrial control, and fluid and pneumatic flow systems.
- Identify electrical symbols in wiring diagrams.
- Identify hydraulic and pneumatic symbols and mechanical symbols and components in Piping and Instrumentation diagrams.

Major Topics to be Included

Critical attention will be given to the following topics:

- Printreading fundamentals
- Alphabet of lines
- Hidden lines and center lines
- Extension lines, dimension lines and projection lines
- Two-view and three-view drawings
- Dimension and notes
- Geometric dimensioning and tolerancing
- Dimensioning cylinders, circles, and arcs
- Size dimensions for holes and angles
- Industrial electrical and electronic symbols
- Location Dimensions for points, centers, and holes
- Dimensioning large arcs and base line dimensions
- Tolerances: Fractional and angular dimensions
- Tolerances: Unilateral and bilateral, decimal Dimensions
- Process and instrumentation systems (P&ID)