BPR-111 Blueprint Reading

COURSE DESCRIPTION:

Prerequisites: None
Corequisites: None

This course introduces the basic principles of print reading. Topics include line types, orthographic projections, dimensioning methods, and notes. Upon completion, students should be able to interpret basic prints and visualize the features of a part or system.

Course Hours Per Week: Class, 1. Lab, 2. Semester Hours Credit, 2.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Interpret symbols, abbreviations, and line types.
2. Identify and describe types of projection and use of views.
3. Draw freehand sketches.
4. Calculate measurements of features.
5. Identify and interpret dimensioning and tolerancing.

OUTLINE OF INSTRUCTION:

I. Introduction
   - A. Basic for interpreting drawings
   - B. Third angle projection
   - C. ISO projection symbol
   - D. Title block
   - E. Drawing standards
   - F. Drawing revisions
   - G. The drafting office
   - H. Drawing reproduction

II. Types of drawings
   - A. Working drawings
   - B. One- and two-view drawings
   - C. Multi detail drawings
   - D. Partial views
   - E. Assembly drawings
     1. Subassembly drawings
     2. Identifying parts of an assembly drawing
   - F. Bill of material (items list)

III. Drawing features
   - A. Lettering on drawings
   - B. Sketching
   - C. Types of lines
     1. Visible lines
     2. Hidden lines

3. Center lines
4. Break lines

D. Inclined surfaces
E. Circular features
F. Identifying similarly sized features
G. Rounds and fillets
H. Intersections of unfinished surfaces
    1. Rounded intersections
    2. Filleted intersections
I. Symmetrical outlines
J. Structural steel shapes
K. Phantom outlines
L. Bosses and pads
M. Abbreviations used on drawings

IV. Measurements and scale
    A. Drawing to scale
        1. Inch and foot scales
        2. Si (metric) scales
    B. Linear units of measurement
        1. Inch units of measurement
        2. Si (metric) units of measurement
    C. Measurement of angles
    D. Measuring dovetails

V. Dimensioning
    A. Placement of dimensions
    B. Dimension lines
    C. Extension lines
    D. leaders
    E. Choice of dimensions
    F. Basic rules for dimensioning
    G. Dimensioning of cylindrical holes
    H. Dimensioning cylindrical holes
    I. Repetitive features and dimensions
    J. Reference dimensioning
    K. Chain dimensioning
    L. Base line dimensioning
    M. Not-to-scale dimensions
    N. Dimension origin symbol
    O. Rectangular coordinate dimensioning without dimension lines
    P. Rectangular coordinate dimensioning in tabular form
    Q. Dimensioning of keyseats

VI. Sections
    A. Sectional views
        1. The cutting plane lines
        2. Section lining
    B. Types of sections
        1. Full sections
        2. Half sections

3. Revolved sections
4. Removed sections

C. Broken out and partial sections
1. Webs in section
2. Ribs in section
3. Spokes in section

D. Alignment of parts and holes
1. Foreshortened projection
2. Holes revolved to show true center distance

E. Section through shafts, pins and keys

VII. Machining operations
A. Drilling, reaming and boring
B. Machine slots
C. Countersinks, counterbores and spotfaces
D. Chamfers
E. Undercuts
F. Tapers
1. Circular tapers
2. Flat tapers

G. Knurls
H. Flats

VIII. Surface finishes
A. Machining symbols
1. Indicating machining allowance
2. Removal of material prohibited

B. Surface texture
C. Surface texture symbol
D. Surface texture ratings
E. Control requirements

IX. Tolerances and allowances
A. Definitions
B. Tolerancing methods
1. Limit dimensioning
2. Plus and minus tolerancing
3. Inch tolerances

X. Threads
A. Threaded fasteners
B. Threaded assemblies
C. Inch threads
D. Right and left-handed threads
E. Metric threads

XI. Components
A. Pin fasteners
1. Machine pins
2. Radial locking pins

B. Keys

C. Setscrews
D. Swivels and universal joints

REQUIRED TEXTBOOK AND MATERIAL:

The textbook and other instructional material will be determined by the instructor to ensure that current, relevant concepts and theories are present.