**WLDG 1313:** Introduction to Blueprint Reading for Welders

**Semester Hours:** 3

**Textbooks:** Blueprint Reading For Welders, by A.E. Bennett & Louis J. Siy, Delmar Publishing, Inc. 1988

**Course Description:**
A study of industrial blueprints. Emphasis placed on terminology, symbols, graphic description, and welding processes. Includes systems of measurement and industry standards. Also includes interpretation of plans and drawings used by industry to facilitate field application and production.

**Course Learning Outcomes:**
The student will define terms and abbreviations; and identify and explain object views, lines, and dimension. The student will identify, explain, and interpret weld symbols; identify structural shapes; demonstrate the proper use of measuring devices; read and interpret blueprints; read welding detail drawings; and calculate dimension and material.

**Supplementary material:** Filmstrips
Handout material
Videos

**Performance Objectives:**
1. Given instructions and practice, the student will develop skills in visualizing shop drawings, and identifying welding symbols by performing the following tasks. This knowledge will be evidenced by laboratory demonstrations, completion of assignment sheets, and by scoring the college minimum satisfactory grade on a written exam within a 50 minute time period.

   A. Draw letters pertaining to drafting, and identify lines and views used in mechanical drawings, and interpret their meaning.

   B. List the most common forms of notes and specifications which appear on shop drawings.

   C. Learn basic dimensioning practices, both English and the metric, and display this knowledge on graded drawings.

   D. Study of AWS Standard A 2.4-86 including the most up-to-date symbols, abbreviations and weld types.

   E. Will learn standard practices for presenting metric expressions and display this knowledge on his/her drawings.
F. Will represent the most common structural shapes on their drawings.

2. Given instructions and practice, the student will fabricate drawings, prepare piping isometrics, and piping specifications. This knowledge will be evidenced by laboratory demonstrations, completion of assignment sheets, and by scoring the college minimum satisfactory grade on a written exam within a 50 minute time period.

   A. Develop drawings showing three views by using the orthographic projection method.
   
   B. Draw a pipe spool sheet from blueprints using the isometric method.
   
   C. Give sizes or dimensions, need to fabricate parts, and also where the components will be placed or machined.

Teaching Methods:

1. Individual and group instructions in the classroom.

2. Groups of four or five students will work together for drafting projects.

3. Overhead projector

4. Handout material

Evaluation Methods:

1. Attendance

2. Lab tests and lab performance

3. Visual inspection of welds on projects

4. Written exams

5. Accuracy of drawings

Course Content:

Unit I: Basic Lines and Views

A. Learn the basic types of lines used on drawings

B. Describe orthographic projection and be able to name the most commonly used views.

Homework: Text--Problems 1-3 pg. 5
            Problems 1-15 pg. 7

Unit II: Sketching
A. Purpose of sketching
B. Techniques of sketching lines, arcs, circles
C. Oblique and Isometric sketching

Homework: Text-Problems 1-4 pgs. 12-13

Unit III: Notes & Specifications
A. Describe notes and specifications
B. Name the parts of a title block

Homework: Text-Problems 1-19, pg. 19

Unit IV: Dimensioning
A. Purpose of Dimensioning
B. Difference between angular and linear dimensions
C. Chamfer & bevel dimensions
D. Drilled hole dimension
E. Tolerance dimensions
F. Thread specifications
G. Preparation of a bill of materials

Homework: Text-Problems 1-27, pgs. 28-30
                       Problems 1-23, pg. 33

Unit V: Bill of Materials
A. Preparation of a bill of materials

          Homework: Text-Problems 1-21, pg. 45
                       Problems 1-16, pg. 49

Unit VI: Structural Shapes
A. Sheet metal and wire gage
B. Common structural shapes
C. Hot rolled and cold rolled stock

Homework: Text problems 1-23 pgs. 64-65
Problems 1-12 pg 67

Unit VII: Other Views

A. Views with conventional breaks
B. Auxiliary views
C. Enlarged detail views
D. Isometric and pictorial
E. Corrections and changes on prints

Homework: Text--Problems 1-11, pgs. 81
Problems 1-13, pg. 85

Unit VIII: Sections

A. Full and half sections
B. Revolved and aligned sections
C. Name the various types of section lines

Homework: Text--Problems 1-13, pg. 95
Problems 1-10, pg. 99

Unit IX: Detail and Assembly Prints

A. What is a detail drawing
B. Purpose of assembly drawings

Homework: Text--Problems 1-20, pg. 107

Unit X: General Abbreviations and Symbols

A. Learn the common abbreviations used on prints
B. Learn the common symbols that appear on prints

Homework: Text--Problems 1-24, pgs. 118-121

Unit XI: Basic Joints For Welding Fabrication

A. Basic types of joints
B. Fabrication joints by cutting and bending
C. Joint fitup

Homework: Text--Problems 1-5, pgs. 137-138

**Unit XII: Fillet Welds**

A. Size of legs
B. Length of fillet welds
C. Pitch and intermittent welding
D. Combining fillet welds with other welds

Homework: Text--Problems 1-7, pgs. 145-146

**Unit XIII: Groove Welds**

A. Groove weld symbols and joints
B. Root opening of groove welds
C. Contour and finishing

Homework: Text--Problems 1-11, pgs. 158-159

Problems 1-6, pg. 161

**Unit XIV: Back and Melt-thru Welds**

A. Selected applications of back or backing symbols
B. Selected applications of melt-thru symbols

Homework: Text--Problems 1-8, pgs. 174

**Unit XV: Plug and Slot Welds**

A. Size of plug and slot welds
B. Depth of filling
C. Contour and finishing
Unit XXII: Applied Metric For Welders

A. Structure of the metric system
B. Derived units
C. Metric prefixes
D. ISO inch and ISO metric screw threads
E. Standard practices for presenting metric expressions and dimensions on metric drawings for welding

Unit XXIII: Pipe Welding Symbols

A. Symbols for pipe layouts ASA Standard Z 32.2.3--1949 (R 1953)
B. Single and double line drawings
C. Methods of representing a pipe layout

Unit XXV: Inspection and Testing

A. Overview of common inspection and testing practices
B. Destructive testing
C. Non-destructive testing
   1. Visual inspection
   2. Ultrasonic inspection
   3. Radiographic inspection
   4. Magnetic particle inspection
   5. Penetrant inspection
   6. Eddy Current inspection

Homework: Text--Problem 1, pgs. 271-273