San Bernardino Valley College
Curriculum Approved: January 24, 2005

I. COURSE INFORMATION:

A. Division: Technical
Department: Machine Trades
Course ID: MACH 090B
Course Title: Engineering Blueprint Reading, Geometric Dimensioning, and Tolerancing
Units: 3
Lecture: 3 hours
Laboratory: None
Prerequisite: None
Corequisite: None
Dept. Advisory: None

B. Catalog and Schedule Description: Blueprint interpretation with emphasis on terminology, Coordinate Measuring Machines (CMM), and concepts related to engineering drawing standards, geometric dimensioning and tolerancing language ANSI Y14.5, and how these apply to the engineering blueprint inspection processes.

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

III. EXPECTED OUTCOMES:

Upon successful completion of the course, the student should be able to:

A. Select geometry objects from an orthographic projection.
B. Describe the various types of assembly drawings.
C. Explain elements of a title block.
D. Identify tolerances, features, and basic dimensions on an industrial blueprint.
E. Distinguish differences between symbols used with ANSI Y14.5 and proposed ASME Y14.5 standards.
F. Select datum feature symbols from an industrial blueprint.
G. Read and interpret a feature control frame.
H. Distinguish the difference between various weld symbols.
I. Define symbols and mathematical terms related to engineering blueprint reading.
J. Demonstrate utilizing a gage 2000 Browne & Sharpe coordinate measuring machine.

IV. COURSE CONTENT:

A. Introduction to Print Reading
   1. Prints: The language of industry
   2. How to read the steel rule
B. Drafting and Print Reading Procedures
   1. The alphabet of lines
   2. Freehand technical sketching
   3. Understanding orthographic projection drawings
   4. Lettering and dimensioning freehand sketches
   5. Auxiliary views
   6. Detail and assembly drawings
   7. Shop mathematics review
   8. Measurement tools
   9. Dimensions and tolerances
   10. Sectional views
   11. Pictorial drawings
C. Title Block, Materials, Notes, and Drawing Changes
   1. The title block
   2. List of materials
   3. Drawing notes

4. The drawing change system

D. Machining Specifications
   1. Geometric dimensioning and tolerancing
   2. Thread representation and specification
   3. Specification and callouts for machining process
   4. Gears, splines, and serrations

E. Specialized Print Reading
   1. Reading numerical control documents
   2. Precision sheet metal prints
   3. Welding prints
   4. Plastic prints
   5. Instrumentation and control diagrams

F. Advanced and Evaluation Activities
   1. Advanced print reading activities
   2. Evaluation activities

G. Reference Section
   1. Standard abbreviations
   2. Standard tables and symbols

V. METHODS OF INSTRUCTION: (Please check all that apply and add any additional not listed.)

X Lecture
_____ Class and/or small group discussion
X Critical evaluation of texts, newspapers, journal articles, and other printed research
_____ Critical evaluation of films, videotapes, audiotapes, or other media forms
X Classroom demonstrations
X Field trips
_____ Guest speakers
_____ Other:
_____ Other:
_____ Other:

VI. TYPICAL OUT-OF-CLASS ASSIGNMENTS:

A. Reading Assignment. Reading assignments are required and may include (but are not limited to) the following: Read "Introductions to Print Reading" and explain the six views of an orthographic projection.

B. Writing Assignment. Writing assignments are required and may include (but are not limited to) the following: Write a process plan for a given print part describing manufacturing process.

C. Critical Thinking Assignment. Critical thinking assignments are required and may include (but are not limited to) the following: Identify geometric symbols on a blueprint describing the symbol relationships to the part geometry.

VII. EVALUATION:

A student's grade will be based on multiple measures of performance and will reflect the objectives explained above. A final grade of "C" or better should indicate that the student has the ability to successfully apply the principles and techniques taught in this course. These evaluation methods may include, but are not limited to, the following (Please check all that apply, and add additional ones not listed):

_____ Portfolios
_____ Projects
X Written papers or reports
_____ Presentations (oral and visual)
_____ Work performance (internships or field work)
_____ Lab work
X Comprehensive examinations (cumulative finals or certifications)

_____ Peer evaluation
_____ Self evaluation
_____ Classroom participation
X Homework
_____ Other:
_____ Other:
_____ Other:

VIII. TYPICAL TEXTS:

A. Brown, Waiter C., Print Reading for Industry, Goodheart Wilcox, 2003
B. Hoffman, Edward G., Student Shop Reference Book, 2nd Edition, Industrial Press, New York, 2002
C. Raisor, Max E., Engineering Graphics Principles with Geometric Tolerancing, 2nd Edition, Sac Publication, Brigham Young University, 2002

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Hand held calculator