San Bernardino Valley College
Curriculum Approved: February 2, 2004
Last Updated: January 2004

I. COURSE DESCRIPTION:

A. Department Information:

Division: Technical
Department: Machine Trades
Course ID: MACH 022B
Course Title: Machine Shop II
Units: 4
Lecture:2 hours
Laboratory: 6 hours
Prerequisite: None
Departmental Advisory: MACH 021B

B. Catalog and Schedule Description:

Second semester intermediate machine shop practices for majors or non-majors with a machining background. Emphasis on safety and Occupational Safety Health Act (OSHA), applied mathematics, and advanced processes on mills, lathes, and tool grinding and NIMS standards.

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

III. EXPECTED OUTCOMES FOR STUDENTS:

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

A. Demonstrate knurling a straight shaft between centers.
B. Set-up a lathe to cut an external 60 degrees V-thread.
C. Illustrate the technique for offhand grinding a threading tool and radius tool.
D. Demonstrate the use of an edge finder on a vertical-milling machine.
E. Prepare a vertical-boring head for machining a .750 hole.
F. Prepare a part for NIMS layout certification.

IV. CONTENT:

A. Safety Overview
   1. General safety
   2. Identify shop hazards
   3. OSHA (Occupational Safety Health Act)
B. Safety in Machine Tool Usage
   1. Cutting tools safety
   2. Cutter safety
   3. Machine tool safety
C. Proficiency in Machine Tool Usage
   1. Demonstrate the proper math for calculating speed for a designated cutter
   2. Demonstrate the proper feed rates for machine tool usage
   3. Use of precision measuring tools
   4. Basic set-ups on lathes, mills, grinders, and drilling machines
D. Identifying Available Resources
   1. Manufacture data on cutting tool technology from Student Ready Reference book
   2. Manufacture data information on material specifications
E. Layout and Measuring Tool Usage
   1. Precision tools for layout to meet NIMS standards
   2. Precision height gauge usage
   3. Micrometer
   4. Dial indicators
   5. Calibers

V. METHODS OF INSTRUCTION:

A. Lecture
B. Machine tool demonstrations
C Interactive computer instruction
D Field trips

VI. TYPICAL ASSIGNMENTS:

A. Using a dial indicator, indicate a machinist vise within .0005 total indicator reading.
B. Utilizing the machinist handbook, look up the speeds and feeds of 1018 CRS material.
C. Calculate the dimension over the wires using thread wires on a ¾ -16 thread.
D. Manufacture a part to a given specification utilizing various precision measuring tools.

VII. EVALUATION(S):

A. Methods of Evaluation:
   1. Graded projects to blueprint specifications
   2. Test
   3. Mid-term
   4. Final exam
      Typical Questions:
      a) On 60 degrees V-thread, why is the compound set at 29 degrees?
      b) Identify tools utilized to layout angular lines to NIMS standards.

B. Frequency of Evaluation:
   1. Six projects
   2. Five tests
   3. One mid-term
   4. One final exam

VIII. TYPICAL TEXT(S):

Walker, John, Machining Fundamentals, 6th Edition, Tinley Park, IL, The Goodheart Wilcox Company, Inc., 2004

Walker, John, Machining Fundamentals Workbook, 6th Edition, Tinley Park, IL, The Goodheart Wilcox Company, Inc., 2004

Hoffman, Edward G., Student Shop Reference Book, 3rd Edition, Madison Avenue, NY, Industrial Press, 2003

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

Safety glasses, trigonometric function calculator

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Content Review Form
DEPARTMENTAL ADVISORY COURSE

Target Course: MACH 022B Machine Shop II

Departmental Advisory Course: MACH 021B Machine Shop I

Instructions:
1. List exit competencies (skills) from the Departmental Advisory Course. These skills are listed in the "Student Outcomes" section of the Course Outline.
2. Indicate which of the listed exit competencies (skills) are necessary entry skills probably needed for success in the target course. Mark with an "X" each needed skill.
3. Indicate the degree of importance of each identified entry skill for course success, using the following rating scale:
   1 = Critical 2 = Very Helpful 3 = Desirable

Skills Analysis

Entry Skills in Target Course	Exit Skills provided by advisory course (mark with an X if needed and indicate advisory course if more than one).	Degree of Importance (Rate 1 – 3)
1. Apply safety in the machine shop area utilizing OSHA standards.	X	2
2. Utilize machine tools in a safe manner.	X	2
3. Accurately hold tolerances to a given print drawing.	X	2
4. Properly maintain equipment to industry specifications.	X	2