



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	MTT
Course Number:	2
Descriptive Title:	Manufacturing Print Reading
Division:	Industry and Technology
Department:	Machine Tool Technology
Course Disciplines:	Machine Tool Technology
Catalog Description:	Students are introduced to engineering drawings and engineering specifications used in manufacturing industries. Representative drawings from simple production to complex assembly will be used to demonstrate concepts and for practice in interpreting the symbols and notations. Geometric Dimensioning and Tolerancing (GD&T) in accordance with American National Standards Institute (ANSI) Y-14.5 standard and the construction of simple machine parts are also discussed.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	3
Hours Laboratory (per week):	0
Outside Study Hours:	6
Total Course Hours:	54
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	Prior to July 1992
Transfer UC:	No
Effective Date:	
General Education:	ECC
Term:	
Other:	
CSU GE:	

	Term:
	Other:
	IGETC:
	Term:
	Other:
Student Learning Outcomes:	<p>SLO #1 Orthographic Orientation</p> <p>Student will correctly sketch a part in orthographic orientation.</p> <p>SLO #2 Multi-View Orthographic Drawings</p> <p>Demonstrate basic understanding or Multi-View Orthographic drawings, including part visualization and interpretation and the mechanics of: dimensioning, tolerancing and drawing.</p> <p>SLO #3 Total Position Tolerance</p> <p>Gain a basic understanding of GD&T (Geometric Dimensioning and Tolerancing) practices. Presented with a Feature Control Frame, students will calculate total positional tolerance of a hole utilizing Maximum Material Condition, Least Material Condition and Regardless of Feature Size Modifiers.</p>
Course Objectives:	<ol style="list-style-type: none"> 1. Understand shop math problems involving fractions, decimals and inch/metric conversions. 2. Compare and contrast the lines, views, title blocks, dimensions, tolerances, pictorials, materials lists, notes, changes, machine processes and symbols used on engineering drawings. 3. Accurately construct, from orthographic projections to demonstrate visualization and interpretation. 4. Analyze engineering drawings with one or more views, thread specifications and dimensions, machine operation call-outs, dimensions, tolerances and geometric dimensioning and tolerancing.
Major Topics:	<p>I. THE LANGUAGE OF INDUSTRY (3 hours, lecture)</p> <ol style="list-style-type: none"> A. Engineering drawings B. Specifications <p>II. ALPHABET OF LINES (3 hours, lecture)</p> <ol style="list-style-type: none"> A. Visible line B. Hidden line C. Center line D. Section line E. Dimensioning line F. Sketching <p>III. UNDERSTANDING ORTHOGRAPHIC PROJECTION (3 hours, lecture)</p> <ol style="list-style-type: none"> A. Geometric construction <ol style="list-style-type: none"> 1. Orientation terminology

- 2. Shape terminology
- B. Multiview drawings
 - 1. Orthographic
 - 2. Dimensions

IV. AUXILIARY VIEWS (3 hours, lecture)

- A. True shape
- B. Inclined surface
- C. Projections
- D. Sketching

V. DIMENSIONING AND TOLERANCING (6 hours, lecture)

- A. Types
- B. Rules
- C. Choice of placement

VI. SECTIONAL VIEWS (3 hours, lecture)

- A. Full
- B. Half
- C. Offset
- D. Aligned

VII. PICTORIAL DRAWINGS (3 hours, lecture)

- A. Detail drawings
- B. Machining drawings
- C. Pattern development drawing
- D. Assembly drawing

VIII. TITLE BLOCKS (3 hours, lecture)

- A. Part name
- B. Part number
- C. List of materials
- D. Drawing notes
- E. General tolerance box

IX. DRAWING NOTES (3 hours, lecture)

- A. Drawing notes
- B. Drawing changes
- C. Drawing revisions

X. THREAD REPRESENTATION AND DESIGNATION (3 hours, lecture)

- A. Definitions
- B. Thread terms
- C. Screw thread forms
- D. Metric threads

	<p>E. Pipe threads</p> <p>XI. MACHINING PROCESSES (3 hours, lecture)</p> <p>A. Bench B. Lathe C. Milling machine D. Drill press E. Computer Numerical Control (CNC)</p> <p>XII. GD&T (6 hours, lecture)</p> <p>A. Standard B. Symbols C. GD&T terminology D. Datums E. Modifiers</p> <p>XIII. GEARS, SPLINES AND SERRATIONS (3 hours, lecture)</p> <p>A. Gears: spur, bevel and worm B. Splines C. Serrations</p> <p>XIV. NUMERICAL CONTROL (NC) DOCUMENTS (6 hours, lecture)</p> <p>A. NC programming documents B. Reference point systems C. Interpreting an NC program</p> <p>XV. WELDING PRINTS (3 hours, lecture)</p> <p>A. Elements of welding B. Welding symbols C. Supplementary symbols</p>
Total Lecture Hours:	54
Total Laboratory Hours:	0
Total Hours:	54
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	Refer to the orthographic projection of the "Corner Gadget Block" provided by the instructor. Using cardboard and tape, construct the "Corner Gadget Block" within an area no larger than 1 cubic foot. Submit gadget block to the instructor for evaluation.
Critical Thinking Assignment 1:	The Arm and Hub Assembly drawing provided incorporates GD&T per ANSI Y-14.5. at Minimum Material Condition (MMC) and calculate the tolerance zone for all of the drilled

	hole. Report findings on a one-page worksheet and submit to the instructor for evaluation.
Critical Thinking Assignment 2:	Examine the engineering drawing for the Lower Support Cylinder Union and interpret the call-outs and feature control frames for each GD&T symbol. Report your findings on a one-page worksheet and submit to the instructor for evaluation.
Other Evaluation Methods:	Completion Homework Problems Matching Items Multiple Choice Other Exams Quizzes True/False
Instructional Methods:	Demonstration Discussion Lecture
If other:	
Work Outside of Class:	Answer questions Problem solving activity Required reading Skill practice Study
If Other:	
Up-To-Date Representative Textbooks:	Walter C. Brown. <u>PRINT READING FOR INDUSTRY</u> . 11 th edition, Goodheart Wilcox, 2022
Alternative Textbooks:	
Required Supplementary Readings:	
Other Required Materials:	
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
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Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Franz Seifert
Date:	10/22/2015
Original Board Approval Date:	09/01/1988
Last Reviewed and/or Revised by:	TIM MONZELLO
Date:	03/02/2022
Last Board Approval Date:	04/18/2022