

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE  
MASTER SYLLABUS

ADVANCED MECHANICAL DRAWING W/ LAB  
CID 1230

**Class Hours: 3.0**

**Credit Hours: 4.0**

**Laboratory Hours: 3.0**

**Date Revised: Spring  
99**

NOTE: This course is not designed for transfer credit.

**Catalog Course Description:**

Advanced Mechanical Drawing covers techniques and fundamental skills essential to produce more complicated entry-level engineering drawings. Computervision Personal Designer is introduced as a 3-D mechanical design tool. Auxiliary views, intersections and developments, and ANSI standard dimensioning and tolerancing are implemented. Use of the computer to generate flat pattern layout drawings is also implemented. Simple assembly drawing is covered.

**Entry Level Standards:**

None

**Prerequisite:**

CID 1100

**Corequisite:**

MTH 1020 or 1021

**Textbook(s) and Other Reference Materials Basic to the Course:**

Textbooks:

*Principles of Technical Drawing*, Giesecke, Mitchel, Spencer, Hill, Dygdon & Novak; Macmillan, Ninth Edition.

*Geometric Tolerancing, A Text-Workbook*, Marrelli, Richard S. and McCuiston, Patrick, J., 2nd Edition

*The MicroStation Modeler Workbook*, Ward, Michael K. and Arroyo, Mike A.

Equipment:

- a. .5, .7, & .9 mechanical pencils with H and 2H leads
- b. 9" or 10" 30-60 triangle
- c. 8" or 10" 45 triangle
- d. Erasing shield
- e. White vinyl eraser
- f. Mechanical engineer's scale
- g. Drafting dots or drafting tape
- h. Ames lettering guide
- i. Sand paper block
- j. Board brush
- k. 8" French curve or larger

- l. 6" dividers or larger
- m. Compass with F or H leads
- n. 8.5 x 11 drafting vellum (1000h equal)
- o. Circle template

### **I. Week/Unit/Topic Basis:**

This schedule may vary slightly depending on the progress of the class.

<b>Week</b>	<b>Topic</b>
1-3	Advanced auxiliary view principles. Introduction to modeling on MicroStation Modeler 95
4-7	Flat pattern layout
8-12	ANSI Standard Dimensioning and Tolerancing
13-16	Assembly drawings

### **II. Course Objectives\*:**

- A. Construct auxiliary views working with intersections of planes and surfaces. I
- B. Construct simple 3-D models using MicroStation Modeler 95. II
- C. Construct and develop models from flat pattern layout drawings for developments. I, II
- D. Comprehend assembly drawings in engineering practices. I
- E. Develop and understand acceptable ANSI dimensioning and tolerancing practices used in production. I, II

\*Roman numerals after course objectives reference goals of the CID program.

### **III. Instructional Processes\*:**

Students will:

1. Demonstrate comprehension of terminology used in association with auxiliary views. *Technological Literacy Outcome*
2. Demonstrate auxiliary views by revolving a part on any given axis. *Problem Solving and Decision Making Outcome, Active Learning Strategies*
3. Show plotting of curves in auxiliary views and understand use of hidden lines in auxiliary views. *Problem Solving and Decision Making Outcome, Active Learning Strategies*
4. Develop auxiliary sectional views and understand principles of intersections for developments. *Problem Solving and Decision Making Outcome, Active Learning Strategies*
5. Show intersection of plane and cylinder in development of flat pattern or cylinders. *Active Learning Strategies*
6. Develop planes and oblique prisms, cylinders and cones by use of models. *Active Learning Strategies, Numerical Literacy Outcome*

7. Develop set of individual working drawings for an assembly project. *Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy*
8. Draw complete assembly set. *Active Learning Strategies, Technological Literacy Outcome, Communication Outcome*

\*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

#### **IV. Expectations for Student Performance\*:**

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

1. Determine the true length of the line. A
2. Locate the point view of true length of the line. A
3. Show the edge view of the surface. A
4. Solve for the true shape of the surface. A
5. Set software and environment variable to create a seed file. B
6. Demonstrate knowledge of parametric solid modeling tools (Polygons, ellipses, complex shapes, projections, b-spine curves, revolved solids and boolean operations). B
7. Create 3 dimensional models of mechanical parts. B, E
8. Utilize sheet views to produce 2 dimensional drawings from the models. B, E
9. Utilize the model to reference individual parts to create an assembly drawing. E
10. Develop a truncated prism using parallel line development. C
11. Create a truncated pyramid using radial line development. C
12. Develop a truncated cylinder using parallel line development. C
13. Create a truncated cone using radial line development. C
14. Know how to read and understand the meaning of Geometric Dimensioning & Tolerancing (GD&T) symbols and terms. F
15. Understand planar and target datums as they relate to GD&T. F
16. Utilize flatness, straightness, circularity, and cylindricity GD&T controls to control form. F
17. Utilize perpendicularity, angularity, and parallelism GD&T controls to control the orientation of parts. F
18. Understand concentricity, symmetry, runout, and profile controls and where to use them. F

\*Letters after performance expectations reference the course objectives listed above.

#### **V. Evaluation:**

A. Testing Procedures:

Evaluation in this course will be based on the quality of the final drawings produced and short quizzes given during the semester. Final grades will be calculated as follows:

Drawings - 70%

Quizzes - 30%

B. Laboratory Expectations:

This course is primarily a laboratory course. Lecture time will be spent explaining the various principles of good graphics. The laboratory time will be spent by student applying these principles to specific drawings on either the board or the computer. Approximately 25 drawings will be required during the semester.

C. Field Work:

Outside reading of material in drawing laboratory will be assigned and its completion is a required part of the course.

D. Grading Scale:

A 91 - 100

B 81 - 90

C 71 - 80

D 60 - 70

F Below 60

**VI. Policies:**

A. Attendance Policy:

Regular attendance is required and expected in this course. Students who miss the equivalent of 10% in either lecture or laboratory time may, at the discretion of the instructor, be dropped one letter grade.

B. Academic Dishonesty:

Cheating will not be tolerated although student cooperation and information sharing is expected and welcomed during laboratory time.