CATALOG COURSE DESCRIPTION:

A broadly focused CAD course for CIDD majors, Engineering Technologies majors and Engineering transfer students. This course covers the basic techniques and principles necessary to produce engineering drawings, including the use of drafting equipment, freehand sketching, geometric construction, orthographic and isometric drawings, dimensioning and assembly drawings. The computer is used as a drafting tool to teach CAD commands and reinforce the concepts of technical drawing.

ENTRY LEVEL STANDARDS:

Must be able to read and write at the college level and have completed DSPM 0800.

PREREQUISITES:

None

TEXTBOOK(S) AND OTHER REFERENCE MATERIALS BASIC TO THE COURSE:

Required Text:
Reference:

EQUIPMENT:
A. Drafting kit:
1. Drafting dots or drafting tape
2. Triangles (8" 45/10" 30-60)
3. Erasing shield
4. White vinyl eraser (or pink pearl 400 A eraser - Optional)
5. Mechanical engineer's scale
6. Ames lettering guide
7. Board brush
8. 8" French curve or larger
9. 6" dividers or larger
10. Compass with F or H leads
11. Isometric ellipse template
12. Protractor
13. Circle template
14. Sand paper pad (Optional)
B. Pencils as required by instructor (non-photo blue pencil - Optional)
C. 3 1/2” floppy disks (HD) (at least 10) or Zip disks (2 or more)
D. Blue print paper (A size)
E. 8.5 x 11 (size A) drafting vellum (1000h or eq)
F. Isometric grid paper
G. Regular .10 grid paper
H. Other equipment as may be required

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Use of instruments</td>
</tr>
<tr>
<td>2</td>
<td>Geometry &amp; geometric constructions</td>
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<tr>
<td>3</td>
<td>Geometric constructions</td>
</tr>
<tr>
<td>4</td>
<td>Three view drawings &amp; sketches</td>
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<tr>
<td>5</td>
<td>Three view drawings &amp; dimensioning</td>
</tr>
<tr>
<td>6</td>
<td>Section drawing with dimensions</td>
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<tr>
<td>7</td>
<td>Section &amp; Auxiliary drawing with dimensions</td>
</tr>
<tr>
<td>8</td>
<td>Auxiliary drawing &amp; introduction to CAD</td>
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<tr>
<td>9</td>
<td>Basic CAD commands</td>
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<tr>
<td>10</td>
<td>Geometric constructions CAD</td>
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<tr>
<td>11</td>
<td>Three view drawings CAD and Templates</td>
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<tr>
<td>12</td>
<td>Three view drawings CAD</td>
</tr>
<tr>
<td>13</td>
<td>Three view drawings CAD</td>
</tr>
<tr>
<td>14</td>
<td>Sections CAD</td>
</tr>
<tr>
<td>15</td>
<td>Auxiliary CAD</td>
</tr>
<tr>
<td>16</td>
<td>Final drawings CAD; (Final exam on CAD timed drawing)</td>
</tr>
</tbody>
</table>

II. Course Objectives*:

A. Represent objects using orthographic projection (3-Views, isometric, sections, auxiliary) and sketches. I
B. Be familiar with basic geometry and understand geometric construction. I, V
C. Know fundamental mechanical dimensioning standards, lettering, graphic standards and techniques required for technical drawing. I, V
D. Construct 2D drawings with annotation using Computer Aided Drafting (CAD) software. I, V
*Roman numerals after course objectives reference goals of the Computer Integrated Drafting and Design program.

III. Instructional Processes*:

Students will:

1. Use drafting equipment to create orthographic drawings. *Problem Solving and Decision Making Outcome, Active Learning Strategies*

2. Use geometric construction to create complex shapes. *Problem Solving and Decision Making Outcome, Active Learning Strategies*

3. Use ANSI standards to dimension objects. *Problem Solving and Decision Making Outcome, Active Learning Strategies*

4. Use the LIMITS, SCALE, UNITS, GRID, and LAYER commands in AutoCAD to create a prototype drawing for a particular purpose. *Problem Solving and Decision Making Outcome, Active Learning Strategies*

5. Create 2D drawings and dimension with ANSI standards with AutoCAD. *Problem Solving and Decision Making Outcome, Active Learning Strategies, Transitional Strategy*

6. Print drawings to scale and with correct line thickness. *Problem Solving and Decision Making Outcome*

7. Use computer skills to save and copy files. *Problem Solving and Decision Making Outcome, Technological Literacy Outcome*

8. Use the computer for interactive communication. *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. Recognize and demonstrate proper use of drafting equipment. C

2. Understand how to read and use an engineering scale. A,C

3. Demonstrate proper sketching techniques for basic drawing. A,C

4. Understand and demonstrate appropriate engineering lettering techniques (ANSI standards). C

5. Demonstrate correct use of guidelines to accomplish spacing, uniformity of lettering. C

6. Be familiar with and use geometric construction. B

7. Be able to perform basic geometric constructions (bisectors, perpendicular lines, tangents, etc.). B

8. Know terminology of geometry (angles, triangles, polygons, etc.). B,C
9. Identify alphabet of lines used in engineering drawings. C
10. Understand proper methods of orthographic projection to develop 2 or 3 views of a part. A,C
11. Demonstrate proper spacing and placement of views. A,C
12. Know fundamental ANSI standards for dimensioning. C
13. Exhibit correct location of holes in circular views. A,C
14. Develop isometric drawings of parts that include regular, inclined, and curved surfaces. A,C
15. Understand and correctly present sectional views. A,C
16. Demonstrate proper use of a cutting plane line. A,C
17. Develop section drawing manually. A,B,C
18. Develop an auxiliary drawing manually. A,B,C
19. Understand the CAD system as a drafting tool. D
20. Dimension a drawing using CAD software. C,D
21. Place text using CAD software. C,D
22. Use layering concepts to organize graphic elements using CAD software. D
23. Produce plots from CAD software. D
24. Produce accurate drawings using CAD software. D
25. Produce section drawing using CAD software. A,D
26. Produce auxiliary drawing using CAD software. A,D
27. Produce a CAD drawing with professional quality graphic standards. A,D

*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, homework, and short quizzes given during the semester. There will be at least one individually produced, timed CAD drawing. Final grades will be calculated as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Board Drawings</td>
<td>35%</td>
</tr>
<tr>
<td>Computer Drawings</td>
<td>35%</td>
</tr>
<tr>
<td>Quizzes &amp; Homework</td>
<td>30%</td>
</tr>
</tbody>
</table>

B. Laboratory Expectations:

This course is primarily a laboratory course. Lecture time will be spent explaining the various
principles and standards required for professional quality graphics. The student's laboratory time will be spent applying these principles to create specific drawings on either the board or the computer. It is not intended that the time required completing projects fit within the scheduled class or lab period. All computer drawings will require the same graphic standards and information as the board drawings.

C. Field Work:

Outside reading and sketching assignments will be required.

D. Other Evaluation Methods:

N/A

E. Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
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<tbody>
<tr>
<td>A</td>
<td>91-100</td>
</tr>
<tr>
<td>B</td>
<td>81-90</td>
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<tr>
<td>C</td>
<td>71-80</td>
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<tr>
<td>D</td>
<td>60-70</td>
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<tr>
<td>F</td>
<td>Below 60</td>
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VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course (Pellissippi State Catalog). Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent. Labs are considered instructional activities, and attendance is required.

B. Academic Dishonesty:

It is expected that students will work together to solve problems, however students are expected to do their own work unless specifically assigned otherwise. Sharing or copying others work is unethical and will be discounted. A pattern of unethical behavior will result in the student being expelled from the class. Copying software will be considered theft.

C. Equipment:

Students are expected to take utmost care when using equipment provided by Pellissippi State. No tobacco use, eating, drinking will be allowed in labs. Students are not to load unauthorized software on the computers. Do not use floppy disks for CAD drawings in any other computers other than in CID labs. Students are responsible for maintaining current copies of drawings on their disks. Do not relocate computers, monitors, digitizers or keyboards without supervision by an instructor. Do not copy, delete or move files without instruction by an instructor.