ENGINEERING DRAWING W/LAB
CID 1105

Class Hours: 3.0 Credit Hours: 4.0
Laboratory Hours: 3.0 Revised: Spring 05

Catalog Course Description:

This course is taught in conjunction with Fundamentals of Technical Drawing for CIDD majors. It covers the basic techniques and principles necessary to produce engineering drawings, including the use of traditional drafting equipment, freehand sketching, geometric construction, descriptive geometry, orthographic and isometric drawing, dimensioning, and assembly drawings as they are applied in a professional environment. The computer is used as a drafting tool to teach CAD commands, reinforce the concepts of technical drawing and reinforce the understanding of drafting standards.

Entry Level Standards:

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

Prerequisites:

None

Corequisite(s)

CID 1100

Textbook(s) and Other Course Materials:

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

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. 8.5 x 11 (size A) drafting vellum (1000h or eq)
E. Isometric grid paper
F. Regular .10 grid paper
G. Other equipment as may be required

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CID curriculum</td>
</tr>
<tr>
<td>2</td>
<td>Computer components and applications</td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Word and Excel</td>
</tr>
<tr>
<td>4</td>
<td>Engineering graphics</td>
</tr>
<tr>
<td>5</td>
<td>Applied geometric construction</td>
</tr>
<tr>
<td>6</td>
<td>3 View Drawing</td>
</tr>
<tr>
<td>7</td>
<td>AutoCAD, opening files and settings</td>
</tr>
<tr>
<td>8</td>
<td>AutoCAD commands</td>
</tr>
<tr>
<td>9</td>
<td>Geometric constructions using CAD</td>
</tr>
<tr>
<td>10</td>
<td>Three view drawings using CAD and templates</td>
</tr>
<tr>
<td>11</td>
<td>Sections using CAD</td>
</tr>
<tr>
<td>12</td>
<td>Auxiliary using CAD</td>
</tr>
<tr>
<td>13</td>
<td>Assembly using CAD</td>
</tr>
<tr>
<td>14</td>
<td>Cover basic Microsoft PowerPoint commands</td>
</tr>
<tr>
<td>15</td>
<td>Final Exam Period</td>
</tr>
</tbody>
</table>
II. Course Objectives*:

A. Represent objects using orthographic projection (3-Views, isometric, sections, auxiliary) and sketches. (a,d,g)

B. Be familiar with basic geometry and understand geometric construction. (a,f)

C. Know fundamental mechanical dimensioning standards, lettering, graphic standards and techniques required for technical drawing. (a,b)

D. Become familiar with descriptive geometry. (a,f)

E. Understand CID curriculum. (g,j)

F. Become familiar with professional environment. (j,k)

G. Become familiar with Microsoft products (Word, Excel, PowerPoint). (g,h,k)

* Letters (a-k) after course objectives reference CID Program Outcomes (as required by ABET).

III. Instructional Processes*:

Students will:

1. Use drafting equipment to create orthographic drawings. *Natural Sciences Outcome, Active Learning Strategies*

2. Use geometric construction to create complex shapes. *Natural Sciences Outcome, Active Learning Strategies*

3. Use ANSI standards to dimension objects. *Natural Sciences 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. *Mathematics Outcome, Active Learning Strategies*

5. Create 2D drawings and dimension with ANSI standards with AutoCAD. *Natural Sciences Outcome, Active Learning Strategies, Transitional Strategy*

6. Print drawings to scale and with correct line thickness. *Mathematics Outcome*

7. Use computer skills to save and copy files. *Natural Sciences Outcome, Technological Literacy Outcome*

8. Use elementary GDT to dimension drawings. *Technical Literacy Outcome*

9. Use descriptive geometry to solve shape description problems. *Technical Literacy Outcome*

10. Use CAD to draw an assembly drawing of a simple machine. *Technical Literacy Outcome*

11. Use the computer for interactive communication. *Technical Literacy Outcome*,
Communication Outcome

12. Plan academic schedule. Communication Outcome

13. Understand relationship of standard engineering drawing conventions to various engineering disciplines. Technical Literacy Outcome

14. Become familiar with computers, computer components, and performance. Technical Literacy Outcome, Mathematics Outcome

*Strategies and outcomes listed after instructional processes reference TBR's goals for strengthening general education knowledge and skills, connecting course work 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. A,B,C,D,E
2. Understand how to read and use an engineering scale. A,C,D
3. Demonstrate proper sketching techniques for basic drawing. A,D
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. A,D,E
7. Be able to perform basic geometric constructions (bisectors, perpendicular lines, tangents, etc.). E
8. Know terminology of geometry (angles, triangles, polygons, etc.). E
9. Identify alphabet of lines used in engineering drawings. A,C
10. Understand proper methods of orthographic projection to develop 2 or 3 views of a part. C
11. Demonstrate proper spacing and placement of views. A,C,D
12. Know fundamental ANSI standards for dimensioning. C,D
13. Exhibit correct location of holes in circular views. A,C,D,E
14. Develop isometric drawings of parts that include regular, inclined, and curved surfaces. A,B,D
15. Understand and correctly present sectional views. C,D
16. Demonstrate proper use of a cutting plane line. C,D
17. Develop section drawing manually. C
18. Develop an auxiliary drawing manually. C
19. Understand the CAD system as a drafting tool. D
20. Dimension a drawing using CAD software. 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. A,B,D
25. Produce section drawing using CAD software. A,B,D
26. Produce auxiliary drawing using CAD software. D
27. Produce a CAD drawing with professional quality graphic standards. E
28. Produce a CAD drawing with professional quality graphic standards. C,D
29. Produce a report of computer components. G
30. Produce a semester academic plan. F, G
31. Interpret drawings of various engineering disciplines. C, F

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

V. Evaluation:

A. Testing Procedures:

Tests, quizzes, timed drawings can be used at the instructor’s discretion.

B. Laboratory Expectations:

Drawings will be assigned for completion as laboratory exercises. These drawings will comprise the majority of the student’s grade. Reports and other assignments will be assigned for completion as laboratory exercises.

Note: Laboratory assignments can not be completed during the scheduled class times. Students will be expected to schedule laboratory times to complete assignments.

C. Field Work:

Students will be expected to research additional resources (library, films, professionals, professional documents, staff, etc.)

D. Other Evaluation Methods:

N/A
E. Grading Scale:

- A  91-100
- B+  85-89%
- B   80-84
- C+  75-79%
- C   70-74%
- D   60-69%
- F   59% and below

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. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent. Class Attendance for Lab: Attendance is required to all lab sessions unless excused by the instructor. Students missing more than four unexcused sessions will receive an "F" and no credit will be received. Students tardy past half an hour will be considered absent.

B. Academic Misconduct:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices: Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments. In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or zero for the assignment or (2) an F for the course.

C. Accommodations for Disabilities:

If you need accommodations because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately (privately after class or in the instructor’s office). To request accommodations, students must register with Services for Students with Disabilities Office located in J.L. Goins Administration Building, Room 127 or 131 or by phone: (865) 539-7153 or (865) 694-6751 Voice/TTD.