DELAWARE TECHNICAL COMMUNITY COLLEGE

Course Number and Title: EDD 131 Engineering Graphics/CAD

Campus Location:
Dover, Stanton

Effective Date:
2018-51

Prerequisite:
MAT 010, ENG 090 or ENG 091, SSC 100 or concurrent

Co-Requisites:
none

Course Credits and Hours:
3.00 credits
2.00 lecture hours/week
4.00 lab hours/week

Course Description:
This course covers the development of basic drafting skills using traditional drafting equipment with special emphasis on computer-aided equipment. The focus includes two-dimensional drawings and the development of orthographic projections with a variety of design problems and study activities to help the student conceptualize and communicate graphically.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
None

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Interpret mechanical drawing and blueprints. (CCC 1, 2, 5, 6; PGC 1, 3)
2. Draw basic architectural plan views. (CCC 1, 2, 5, 6; PGC 1, 3)
3. Hand sketch designs using graph paper. (CCC 1, 2, 5, 6; PGC 1, 3)
4. Draw designs and layouts using common orthographic and pictorial methods with computer-aided drafting software. (CCC 2, 5, 6; PGC 1, 3)
5. Detail computer-aided design/drafting (CAD) generated working drawings using proper dimensioning and annotation techniques. (CCC 2, 5, 6; PGC 1, 3, 4)
6. Produce solid models and machine assemblies using 3D solid modeling software. (CCC 1, 2, 3, 5, 6; PGC 1, 3, 4, 6)
7. Create a product prototype using additive manufacturing. (CCC 1, 2, 3, 5, 6; PGC 1, 3, 4, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Interpret mechanical drawing and blueprints.
   1. Identify and use common line style properly, including object lines, hidden lines, center lines, extension, dimension lines, and projection lines.
   2. Read size and location dimensions.
   3. Discriminate between good and poor dimensioning practices.
   4. Discriminate between the possible orthographic views.
   5. Read blueprints and determine sizes and distances that are not dimensioned.
2. Draw basic architectural plan views.
   1. Sketch lines, arcs, and circles.
   2. Use line styles as needed on sketches.
   3. Produce neatly lettered text on sketches.
   4. Sketch one-, two-, and three-view orthographic drawings.
   5. Sketch auxiliary views.
   6. Draw section views with crosshatching.
3. Hand sketch designs using graph paper.
   1. Place linear dimensions.
   2. Dimension cylinders, circles, and arcs.
   3. Dimension drilled holes, counterbores, countersinks, and angles.
   4. Identify and specify proper tolerancing as needed.
4. Draw designs and layouts using common orthographic and pictorial methods with computer-aided drafting software.
   1. Create a new CAD drawing.
   2. Create a prototype or template environment.
   3. Use common CAD precision input methods.
   4. Set up the grid system and snap system.
5. Detail computer-aided design/drafting (CAD) generated working drawings using proper dimensioning and annotation techniques.
   1. Plot CAD drawings to scale.
   2. Create level structures with line weights, colors, and line styles.
   3. Set appropriate unit and dimensioning parameters.
   4. Adjust view windows on the CAD screen.
   5. Accurately place graphic elements such as lines, circles, arc, ellipses, polygons, and line strings.
   6. Place text elements.
   7. Manipulate and modify elements in a CAD drawing.
   8. Create and place symbols.
   9. Save, store, and rename design files.
   10. Dimension and annotate mechanical drawings and plan views.
6. Produce solid models and machine assemblies using 3D solid modeling software.
   1. Generate solid shapes.
   2. Modify solids by placing holes, chamfers, and cuts.
   3. Add features to solid models such as circular bosses, protrusions, and radii.
   4. Assemble solid models into a working assembly.
   5. Create detail drawings from solid models.
7. Create a product prototype using additive manufacturing.
   1. Compose and apply a simulation/engineering design analysis using 3D Solid Modeling software.
   2. Design, develop, and produce a 3D product using additive manufacturing.

Evaluation Criteria/Policies:
Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	–	100	=	A
83	–	91	=	B
75	–	82	=	C
0	–	74	=	F

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Prepare detailed mechanical, machine, architectural, structural, HVAC, industrial piping electrical/electronic drawings for light commercial, manufacturing, and industrial companies.
2. Perform routine structural design calculations required to size steel beams, columns, and decking materials in accordance with AISC standards, and reinforced concrete slabs, foundation footings in accordance with ACI standards.
3. Support manufacturing office administration activities with ability to read and interpret drawings and specifications, prepare technically accurate drawings using both manual and CAD techniques, perform quantity surveys, and organize cost data for cost estimating functions, prepare or check shop drawings, assist in the planning or coordinating of manufacturing activities, assist designers, and coordinate the preparation and review of bid packages.
4. Communicate in a clear and concise manner with peers and management, verbally and in writing, through the preparation of technical reports, effective inner-office and business correspondence, and contribute to the development of manufacturing specifications and other written contract documents.
5. Provide meaningful and innovative assistance to supervising engineers or designers by developing layout design solutions to manufacturing problems, recommending alternate material substitutions or methods of production, and applying reference resources to collect, organize and analyze required research data.
6. Collect, organize, and analyze data for manufacturing machine parts, prepare plans for department/client approval.
7. Demonstrate a professional attitude by working efficiently in close cooperation with others, being adaptable to changes in plans, and giving proper credit for assistance received through outside resources.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.