

**COURSE PREFIX/NO:** EGT 252  
**COURSE TITLE:** Advanced CAD  
**LEC HRS/WK:** 2.0  
**LAB HRS/WK:** 3.0  
**CREDIT HRS/SEMESTER:** 3.0

[Distance Learning Attendance/VA Statement](#)  
[Textbook Information](#)

### **COURSE DESCRIPTION**

This course covers advanced concepts of CAD software and applications.

### **COURSE COMPETENCIES**

The focus of this course is 3D, parametric, feature-based solid modeling as used in manufacturing environments.

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

#### **MODULE 1: Solid Modeling**

- Choose appropriate file type (part, assembly, drawing, etc.)
- Establish sketch planes and construct sketches
- Create sketched features, placed features, and work features
- Choose appropriate Boolean operation (join, cut, etc.)

#### **MODULE 2: Sheet Metal Modeling**

- Utilize special sheet metal tools for sketched and placed features
- Generate 2D flat patterns from 3D models

#### **MODULE 3: Assembly Modeling**

- Describe the three approaches to assemblies (top-down, bottoms-up, and hybrid)
- Apply assembly constraints to reflect design intent
- Create a presentation/exploded view of an assembly

#### **MODULE 4: Engineering Drawings**

- Utilize sheets, borders, and title blocks
- Construct standard 2D drawing views from 3D models
- Apply design information (dimensions, symbols, bills of material, etc.)
- Plot final drawing in proper format

### **MINIMAL STANDARDS:**

Given a time limit and either standard 2D orthographic views or a dimensioned 3D illustration, student should be able to construct a solid model of the object using the software demonstrated in class.

Given dimensional part information, an assembly illustration, and a time limit, student should be able to create the solid model parts and properly constrain them as an assembly using the software demonstrated in class.

After creating part and assembly models, student should be able, within a given time limit, to use the 3D models to create standard 2D drawing views using the software demonstrated in class. Student should then be able to add appropriate supplemental information (such as dimensions) to complete the drawing views.

Given written instructions and dimensional data, and utilizing the standards of drafting learned in this and prerequisite courses, student should be able to construct solid models, assembly models, drawing views, and exploded views of a given device and then prepare and plot standard engineering drawings in the designated format.

Student must complete all modules and achieve a 60% average on tests, projects, reports, and any other required assignments.

## **COURSE REQUIREMENTS**

### **ATTENDANCE**

Students will be bound by the policies stated in the York Technical College Student Handbook.

In case a student does miss a class, the student is responsible for obtaining the material that was covered during the absence.

Since tests are performance-based, timed, and observed, and since the complexity of a different part would by definition be different, ***NO MAKE UP TESTS WILL BE GIVEN.***

If a student is aware that a test will be missed, then the student should notify the instructor prior to the class period, or at the earliest possible date. At the discretion of the instructor, based on documentation provided by the student, the student may be given an alternate assignment to substitute for the test grade. (For example, a term paper of length and topic determined by the instructor.)

The student has the burden to be sure that some arrangement was made with the instructor for resolving a missed test. If no arrangements are made, or proper documentation is not provided regarding the absence, a grade of zero will be recorded for that test.

### **PARTICIPATION IN CLASS DISCUSSIONS**

It is expected that students will participate in class discussions and take notes during lectures. It is also expected that students will not use the computers during lectures and demonstrations unless specifically directed to do so by the instructor.

### **ACADEMIC HONESTY**

Students are expected to adhere to the College policy regarding student conduct as stated in the College handbook. "York Technical College adheres to the South Carolina TECH Student Code, approved by the State Board for Technical and Comprehensive Education on June 10, 1998. Copies of this code are available in the Library and from Student Services. ...Any student caught cheating or involved in any other academic dishonesty will be given a grade of zero and will be subject to further disciplinary action."

### **EVALUATION STRATEGIES/GRADING**

All modules are weighted equally.

The grading scale is as follows:

A	90 - 100
B	80 - 89
C	70 - 79
D	60 - 69
F	0 - 59

The class grade will be determined as follows:

Tests	= 50%
Assignments	= 20%
Final Exam/Project	= 25%
Conduct/Participation	= <u>5%</u>
	100%

Testing will normally be timed and performance based and will focus on the student completing models using the CAD software and turning in a diskette or other media for evaluation.

### **ENTRY LEVEL SKILLS**

The entering student should have knowledge and understanding of basic drafting and dimensioning guidelines and practices. Students should also have an understanding of three-view orthographic projection and the format of standard engineering drawings. Students should have prior experience preparing drawings with a basic CAD package (e.g., AutoCAD).

**PREREQUISITES:** EGT 115 or equivalent

**CO-REQUISITES:** None

**Disability Statement:** Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Office (SRO) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.

### **TOPIC/CONTENT OUTLINE**

Solid Modeling:

- 3D Model types (wireframe, surface, solid)
- File types (part, assembly, drawing, etc.)
- Parametric and feature-based modeling
- Sketch planes and sketches
- Sketched features, placed features, and work features
- Boolean operations (join, cut, etc.)
- Viewing the model

Sheet Metal Modeling:

- Special sheet metal tools for sketched and placed features
- Generating 2D flat patterns from 3D models

Assembly Modeling:

- Approaches to assemblies (top-down, bottoms-up, hybrid)
- Assembly constraints
- Presentation/exploded views

## Engineering Drawings:

- Sheets, borders, and title blocks
- Drawing views
- Design information (dimensions, symbols, bills of material, etc.)
- Plotting