

# COMPUTER AID DESIGN (CAD)

## CAD 1 3 units

### Intro to Computer Aided Design SolidWorks 36 hours lecture, 72 hours laboratory

Grading: letter grade or pass/no pass.

Formerly CAD 50/DRAFT 51A. This course covers the principles of engineering drawings in visually communicating engineering designs and an introduction to computer-aided design (CAD) using SolidWorks. Topics include the development of visualization skills; orthographic projections; mechanical dimensioning and tolerancing practices; and the engineering design process for the use in the mechanical and engineering technology fields. Assignments develop sketching, 2-D and 3-D CAD skills. The use of SolidWorks CAD software is an integral part of the course.

Transferable to CSU Only

## CAD 2 3 units

### Intro to Computer Aided Design AutoCAD 36 hours lecture, 72 hours laboratory

Grading: letter grade or pass/no pass.

Formerly CAD 202/DRAFT 202. This course covers the principles of engineering drawings in visually communicating engineering designs and an introduction to computer-aided design (CAD) using AutoCAD. Topics include the development of engineering documentation for civil, architectural and mechanical engineering applications; visualization skills; orthographic projections; dimensioning and tolerancing practices; and the engineering design process. Assignments develop sketching, 2-D and 3-D CAD skills. The use of AutoCAD software is an integral part of the course.

Transferable to CSU Only

## CAD 3 3 units

### Intro to Computer Aided Design CATIA 36 hours lecture, 72 hours laboratory

Grading: letter grade or pass/no pass.

Formerly CAD 220/DRAFT 220. This course covers the principles of engineering drawings in visually communicating engineering designs and an introduction to computer-aided design (CAD) using CATIA. Topics include the development of visualization skills; orthographic projections; mechanical dimensioning and tolerancing practices; and the engineering design process for the aerospace industry. Assignments develop sketching, 2-D and 3-D CAD skills. The use of CATIA CAD software is an integral part of the course.

Transferable to CSU Only

## CAD 4 3 units

### Geometric Dimensioning and Tolerancing 36 hours lecture, 72 hours laboratory

Recommended Preparation: CAD 1.

Grading: letter grade or pass/no pass.

Formerly CAD 60/DRAFT 60. This course is designed for engineers, designers, technicians, drafters, quality, inspection, manufacturing, tooling, production, management, procurement, and purchasing professionals in the aerospace and manufacturing fields. The course covers a review Geometric Dimensioning and Tolerancing standards per ASME Y14.5 on engineering documentation. Topics include; conventional dimensioning, dimensioning and geometric tolerancing symbols, datums, material condition symbols, tolerances of form, profile, orientation, runout, position, modifiers and common inspection procedures.

Transferable to CSU Only

## CAD 5 3 units

### Intro to CAD/CAM MasterCAM

#### 36 hours lecture, 72 hours laboratory

Recommended Preparation: CAD 1.

Grading: letter grade or pass/no pass.

Formerly CAD 52/DRAFT 52A. This course covers the successful transfer of manufacturable design models and drawings to Computer Aided Manufacturing (CAM) software using MasterCAM. The course emphasizes CAM programming for Computer Numerical Control (CNC) machine tools. Concepts studied will include geometry construction, tooling design, tool paths and motion, machine functions, programming, verification and conformance to detail drawings per ASME Y14.5 standards. Students will create programs from designed models and detail drawings using CAM software. CAD/CAM software is an integral part of this course.

Transferable to CSU Only

## CAD 6 3 units

### Computer Aided Design Advanced

#### 36 hours lecture, 72 hours laboratory

Recommended Preparation: CAD 1, CAD 2, CAD 3, or ETEC 20.

Grading: letter grade or pass/no pass.

Formerly CAD 51/DRAFT 51B. This course covers CAD software used to create advanced 3D models, advanced 2D engineering detail and assembly drawings while applying dimensioning and tolerancing standards per ASME Y14.5. Engineering designs will include advanced solid modeling tools, techniques, surfaces, complex assemblies, model-based definition and sheet metal parts. Complex orthographic detail and assembly drawings will be developed and produced by the individual student or in student teams. Projects will include development of 3D models, 3D printed parts, and documentation through reverse engineering and the engineering design process.

Transferable to CSU Only

## CAD 203 2 units

### AutoCAD II, Advanced Concepts

#### 18 hours lecture, 54 hours laboratory

Prerequisite: CAD 2.

Grading: letter grade or pass/no pass.

Formerly DRAFT 203AD. This course is 2nd in a series of 3 classes leading to a certificate - CAD Professional (324 Hours). This intermediate level AutoCAD class is aimed at individuals with a drafting background employed in engineering, architecture, interior design and other related fields who wish to upgrade their skills in the area of Computer Aided Drafting (CAD). Topics cover advanced 2D concepts and intermediate level 3D modeling using AutoCAD Software: user interface, advanced draw, edit, and query commands, template drawings, dimension styles, model space/paper space electronic drawing sheets, external reference styles, file management and the Web, plotting styles, blocks and attributes and 3D modeling techniques.

**CAD 204 2 units**

**3D Visualization/Animation**

**18 hours lecture, 54 hours laboratory**

Prerequisite: CAD 203.

Grading: letter grade or pass/no pass.

Formerly DRAFT 204. This course is an advanced-level course primarily aimed at individuals with a drafting background employed in engineering, architecture, interior design and other related fields who wish to upgrade their skills in the area of Computer Aided Drafting (CAD), Visualization, Rendering and Animation. CAD training will utilize AutoCAD and one or more of the following – Architectural Desktop, Sketchup, REVIT Architecture and 3D Studio MAX Software. Digital non-linear editing is introduced. Advanced 3D modeling and rendering concepts are explored: user interface, coordinate system, surface and solids modeling commands, rendering and animation. Projects cover both mechanical and architectural applications.

**CAD 221 2 units**

**Intermediate CATIA**

**18 hours lecture, 54 hours laboratory**

Recommended Preparation: CAD 3.

Grading: letter grade or pass/no pass.

Formerly DRAFT 221. This course is the second course in a series of three preparing students for careers as computer aided drafting operators in various industries utilizing CATIA parametric design software. This intermediate level class introduces students to the more complex operations of CATIA software than the former class by concentrating on advanced design solids modeling concepts and applying them in the creation of industry standard detail parts drawings and advanced assembly/subassembly drawings in a Windows environment. The course may serve as a preparation for students intending to take industry certification tests CATIA PART DESIGN Expert and CATIA Assembly Design Expert created by Dessault Systems.