

# DRAFTING AND DESIGN TECHNOLOGY

Design and Engineering Drawing Technology, a career technical and transfer program, uses hands-on experiences to prepare students for entry-level employment or advancement that requires graphic communications, including sketches, mechanical drawings, computer-aided design, and illustrations. Design and Engineering Drawing technology courses fulfill lower division requirements for transfer majors in architecture, electronics, engineering, and Computer Generated Imagery (CGI) and lead to an associate degree in Design and Engineering Drawing technology and certificates of achievement in computer aided design (CAD)—architecture and drafting and computer generated imagery (CGI).

## Faculty

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## Contact Information

### Division

Career/Technical Education

### Dean

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### Discipline Website

<https://www.citruscollege.edu/academics/programs/draf> (<https://www.citruscollege.edu/academics/programs/draf/>)

## Learning Outcomes

This discipline prepares students to do the following:

- Demonstrate planning techniques and administration of architectural, Computer Generated Imagery (CGI) and document control for design and technical working drawings.
- Describe effective architectural, Computer Generated Imagery (CGI) and drafting techniques including graphic communication of design and technical drawings, orientation of design and technical drawings, and the decision making process for design and technical drawings.
- Estimate time, material, labor and equipment required for this expertise.
- Students think logically and coherently about technical issues and gain an appreciation for the global social and political impact

of technical endeavors. By working together in the lab and/or on projects, students develop interpersonal skills and respect for others.

- Demonstrate the ability to use technology to prepare hand drawings, Computer Aided Drawings (CAD), and multimedia presentations.

## Courses

### DRAF 101

#### Beginning Computer Aided Design (CAD)

**3 Units (AA/AS; CSU)**

**36 lecture hours, 72 lab hours**

**Grade Mode: Standard Letter**

*Strongly recommended: ENGL 101.*

A basic course for pre-engineering, pre-architecture students, and other students who have no previous Computer Aided Design (CAD) and mechanical drawing experience.

### DRAF 102

#### Visual Communication

**2.5 Units (AA/AS; CSU)**

**36 lecture hours, 36 lab hours**

**Equivalent to: ARCH 102**

**Grade Mode: Standard Letter**

*Strongly recommended: DRAF 101.*

Visual communication of 2-D and 3-D forms and functions are explored using sketching, drawing, and 2-D and 3-D software. Using 2-D and 3-D software, natural and man made forms are analyzed. Color and texture of form are studied as they are revealed by light, shade, and shadow. Students' perceptions of subject matter are translated into convincing visual expressions by learning the graphic skills and the use of a variety of media. Students sketch, draw, and render projects.

### DRAF 103

#### Advanced Engineering Drawing

**3 Units (AA/AS; CSU)**

**36 lecture hours, 72 lab hours**

**Grade Mode: Standard Letter**

*Prerequisite(s): DRAF 101 or one year high school mechanical drafting.*

Covers the application of the latest industrial design standards of orthographic projection and dimensioning specifications in the production of mechanical items and assemblies. Advanced problems in instrumental drawing, lettering, geometric construction, multi-view projections, sections, auxiliary views and descriptive geometry.

### DRAF 160

#### Foundation Digital Design Tools - Intermediate Computer Aided Design (CAD)

**3 Units (AA/AS; CSU)**

**45 lecture hours, 27 lab hours**

**Grade Mode: Standard Letter**

*Strongly recommended: DRAF 101, one year of high school drafting or industry drafting experience.*

Digital design drawing, modeling, tools, skills and concepts actively used in concurrent design studio. Assignments support concurrent design studio activity with an emphasis on introductory to intermediate digital design drawing. Computer-aided design (CAD) systems are applied to special problems in design. Techniques in creating symbol libraries are explored. Proper and efficient methods of producing plan views, sections, details and elevations are introduced along with dimensioning fundamentals and sheet layout.

**DRAF 161****Advanced Computer Aided Design (CAD and Design Tools)****3 Units (AA/AS; CSU)****45 lecture hours, 27 lab hours****Grade Mode: Standard Letter***Prerequisite(s): DRAF 160.**Strongly recommended: DRAF 101.*

An advanced computer-aided design (CAD) course developing 2-D and 3-D design projects. Digital design drawing and modeling, tools, skills and concepts actively used in concurrent design studio. Assignments support concurrent design studio activity with an emphasis on sketching, digital modeling for design study, iteration, variation, design illustration and representation with Building Information Modeling (BIM).

**DRAF 190****Advanced Digital Design Tools****3 Units (AA/AS; CSU)****45 lecture hours, 27 lab hours****Grade Mode: Standard Letter***Prerequisite(s): DRAF 160.*

Advanced Digital Design drawing and modeling, tools, skills and concepts actively used in concurrent design studios and industry. Assignments support concurrent design studio and industry activity with an emphasis on Building Information Modeling (BIM) using SketchUp, Rhino and other current industry standard software designed to complete the student's preparation for employment.

**DRAF 290****Introduction to Maya Practices****3 Units (AA/AS; CSU)****45 lecture hours, 27 lab hours****Grade Mode: Standard Letter***Strongly recommended: DRAF 160 or DRAF 161 or digital art classes.*

Introduction to modeling, animation and render using Maya with a focus on establishing a working knowledge of Maya's animation tools and techniques, this course builds a solid foundation for developing character animation and special effects sequences. The course uses the two different sections of the Learning Maya tutorial book to provide the student with an overview of the Maya environment and how it can be applied to their work.

**DRAF 291****Learning Maya Transitions****3 Units (AA/AS; CSU)****36 lecture hours****Grade Mode: Standard Letter***Prerequisite(s): DRAF 290.*

Explores how modeling, animating and rendering using CAD, and other 3D interfaces transition into Maya. This course builds an advanced foundation using animation and special effects. The course uses the two different sections of the Learning Maya Transitions book to provide the student with an overview of the Maya environment and how it can be applied to their work. 54 lab hours.

**DRAF 698C****Cooperative Education****3 Units (AA/AS)****180 lab hours arranged****Grade Mode: Pass/No Pass, Standard Letter***Prerequisite(s): The student must be simultaneously enrolled in a class that relates to the Cooperative Education class.*

A course designed to assist students in planning and accomplishing meaningful learning objectives related to Drafting Technology at their place of volunteer employment or training sites.

**DRAF 699A****Cooperative Education****1 Unit (AA/AS)****75 lab hours arranged****Grade Mode: Pass/No Pass, Standard Letter***Prerequisite(s): The student must be simultaneously enrolled in a class that relates to the Cooperative Education course.*

A course designed to assist students in planning and accomplishing meaningful learning objectives related to Drafting Technology at their place of paid employment or training sites.

**DRAF 699C****Cooperative Education****3 Units (AA/AS)****225 lab hours arranged****Grade Mode: Pass/No Pass, Standard Letter***Prerequisite(s): The student must be simultaneously enrolled in a class that relates to the Cooperative Education class.*

A course designed to assist students in planning and accomplishing meaningful learning objectives related to Drafting Technology at their place of paid employment or training sites.

## Programs

**Associate Degree**

- A.S. in Design and Engineering Drawing Technology (<http://catalog.citruscollege.edu/disciplines/drafting-design-technology/design-engineering-drawing-technology-as/>)

**Certificates of Achievement**

- Computer Generated Imagery (CGI) (<http://catalog.citruscollege.edu/disciplines/drafting-design-technology/computer-generated-imagery/cgi-certificate-achievement/>)
- Computer Aided Design (CAD) - Architecture and Drafting (<http://catalog.citruscollege.edu/disciplines/architecture/computer-aided-design-cad-architecture-drafting-certificate-achievement/>)