# DDGT-240: DIGITAL DESIGN GRAPHICS TECHNOLOGY 3

**Effective Term**
Fall 2026

**CC Approval**
11/07/2025

**AS Approval**
11/13/2025

**BOT Approval**
11/20/2025

**COCI Approval**
12/15/2025

## SECTION A - Course Data Elements

**CB04 Credit Status**
Credit - Degree Applicable

**Discipline**

| Minimum Qualifications | Or |
|---|---|
| Drafting/CADD (Computer Aided Drafting/Design) (Any Degree and Professional Experience) | |

**Subject Code**
DDGT - Digital Design Graphics Technology
**Course Number**
240

**Department**
Digital Design Graphics Technology

**Division**
Career Education and Workforce Development (CEWD)

**Full Course Title**
Digital Design Graphics Technology 3

**Short Title**
Digital Design Graphics Tech 3

**CB03 TOP Code**
0953.00 - *Drafting Technology

**CIP Code**
15.0301

**CB08 Basic Skills Status**
NBS - Not Basic Skills

**CB09 SAM Code**
B - Advanced Occupational

**Rationale**
CTE course review per Title V requirement.

## SECTION B - Course Description

**Catalog Course Description**

The third of a four course series in the Digital Design Graphics Technology A.S. Degree program. This course enables the student to learn and apply mechanical computer-aided design (CAD) drafting skills and techniques to working drawings, including Geometric Dimensioning and Tolerancing (GD+T) and weldment symbology, using the AutoCAD and Inventor Professional software programs. Additional topics include external references and reverse engineering of assemblies. A study of 3D Printing.

Students will 3D Print and retain the printed model. A study of 3ds Max for design visualization, including: modeling, materials, lighting, rigging, animation, and rendering. A study of Adobe Premiere as a non-linear video editor. A combined study of 3ds Max and Adobe Premiere to create technically animated presentational videos for their professional portfolios as displayed on the department website.

## SECTION C - Conditions on Enrollment

**Open Entry/Open Exit**

No

**Repeatability**

Not Repeatable

**Grading Options**

Letter Grade Only

**Allow Audit**

Yes

## Requisites

**Prerequisite(s)**

Completion of DDGT-121 with a minimum grade of C.

## Requisite Justification

**Requisite Description**

Course in a Sequence

**Subject**

DDGT

**Course #**

121

**Level of Scrutiny**

Content Review

**Upon entering this course, students should be able to:**

1. Knowledge of digital three-dimensional (3D) modeling fundamentals
2. Knowledge of Boolean operations
3. Ability to produce rendered images of 3D models
4. Ability to utilize various light types for rendered images
5. Ability to reference external digital image files
6. Ability to post graphic files on websites across the Internet

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## SECTION D - Course Standards

**Is this course variable unit?**

No

**Units**

7.00

**Lecture Hours**
54.00

**Lab Hours**
216.00

**Outside of Class Hours**
108

**Total Contact Hours**
270

**Total Student Hours**
378

## Distance Education Approval

**Is this course offered through Distance Education?**
Yes

**Online Delivery Methods**

| DE Modalities | Permanent or Emergency Only? |
|---|---|
| Entirely Online | Permanent |
| Hybrid | Permanent |
| Online with Proctored Exams | Permanent |

## SECTION E - Course Content

**Student Learning Outcomes**

| | Upon satisfactory completion of the course, students will be able to: |
|---|---|
| 1. | Demonstrate proficiency with AutoCAD tools and commands to earn an Autodesk Certificate of Training. |
| 2. | Design and produce an animated presentation utilizing the latest release of the Autodesk ds Max Design software. |
| 3. | Demonstrate technical proficiency in video production by creating and editing digital video projects using Adobe Premiere. |

**Course Objectives**

| | Upon satisfactory completion of the course, students will be able to: |
|---|---|
| 1. | Create and detail complex-shaped three-dimensional models and assemblies in working drawings. |
| 2. | Create working drawings from reverse engineering assemblies. |
| 3. | Effectively apply various Geometric Dimensioning & Tolerancing (GD&T) controls to detail drawings. |
| 4. | Utilize symbology pertinent to weldment drawings. |
| 5. | Understand the advantages and limitations of power transmitting mechanical devices. |
| 6. | Understand the basic components of a CAD Network and basic networking installation tools. |
| 7. | Create and modify three-dimensional models for 3D Printing. |
| 8. | Effectively use three-dimensional animation software. |
| 9. | Understand the differences between surface and solid modeling. |
| 10. | Successfully import, link, or merge various file types for animation purposes. |
| 11. | Create and edit two-dimensional and three-dimensional objects for animation purposes. |
| 12. | Create surface materials using a material editor. |
| 13. | Create custom materials with image editing software. |
| 14. | Design and customize effective lighting techniques for rendered scenes. |
| 15. | Animate object transforms and modifiers. |
| 16. | Produce realistic rendered images of solid models. |
| 17. | Effectively use non-linear video editing software. |
| 18. | Import rendered files from animating software to create professional level videos. |

| | |
|---|---|
| 19. | Create professional level video titles. |
| 20. | Work with multiple video and audio tracks. |
| 21. | Understand video input and output settings for various mediums. |
| 22. | Create and play video animations. |
| 23. | Professionally upload and post rendered videos to their portfolio website. |

**Course Content**

1. Geometric Dimensioning and Tolerancing (GD&T)
   a. Terminology
   b. Geometric Characteristics: Straightness, Flatness, Circularity, Cylindricity, Profile of a Line, Profile of a Surface, Angularity, Perpendicularity, Parallelism, Position, Concentricity, Symmetry, Circular Runout, Total Runout, Maximum Material Condition, Least Material Condition, Basic Dimension
   c. GD&T Symbology
   d. Inspection Tools
   e. Datums and Datum Features
   f. Geometric Controls
   g. Virtual Condition
   h. Methods and Applications
   i. Creation of Working Drawings Utilizing GD&T
2. Welding Drawings
   a. Terminology
   b. Welding Processes (Gas and Arc, Resistance)
   c. Welding Joint Types
   d. Welding Symbology
   e. Weld Types (Fillets, Groove , Plug or Slot, Spot, Seam, Surface)
   f. Creation of Weldment Working Drawings
3. Gears
   a. Terminology
   b. Types and Classifications (Spur, Helical, Herringbone, Bevel, Crossed Helical, Hypoid, Worm, Rack and Pinion)
   c. Gear Shaft Positions (Parallel, Intersecting, Non-Intersecting)
   d. Gear Teeth and Involute Curves
   e. Gear Ratios
   f. Advantages and Limitations
4. Cams
   a. Terminology
   b. Types and Classifications (Face, Groove, Cylindrical)
   c. Follower and Follower Types
   d. Displacement Diagrams
   e. Motion Types (Uniform, Harmonic, Uniformly Accelrated)
   f. Creation of a Cam Profile and Offset Cam Profile
5. Linkages
   a. Terminology
   b. Applications
6. Bearings
   a. Terminology
   b. Types of Forces (Radial, Thrust, Combination)
   c. Types of Bearings (Ball, Roller, Needle)
   d. Working Drawing Bearing Representations
7. Belts
   a. Terminology
   b. Materials
   c. Types of Belts (Flat, Grooved or Serr ated, Positive Drive, V-Belts)
   d. Idlers
   e. Advantages and Limitation
8. Chains
   a. Terminology
   b. Types of Chains (Pintle, Offset, Roller, Inverted Tooth)

   c. Spockets
   d. Advantages and Limitations
9. Couplings
   a. Terminology
   b. Types of Couplings (Solid, Flexible, and Universal)
10. Lubricants and Seals
   a. Terminology
   b. Oils vs Greases
   c. Advantages and Limitations
   d. Types of Seals (Radial, Clearance, O-Rings)
   e. Gaskets (Metallic and Non-Metallic)
11. Reverse Engineering of Assemblies
12. CAD Networks
   a. Description of CAD Network Components
   b. Networking Installation Tools Overview
   c. Cabling, Keystones, CAT Cables, and Accessories Overview
13. 3D Printing
   a. Overview
   b. Capabilities and Limitations
   c. Cost of Materials Considerations
   d. Strength of Part Considerations
   e. Parts vs. Assemblies
   f. Clearances and Tolerances
14. 3ds Max Fundamentals
   a. Introduction to 3ds Max
   b. User Interface
   c. Configuration
   d. Project Files
   e. Data Linking and Merging
   f. Importing
   g. Layer Management
   h. Basic Modeling Techniques
   i. Modeling From 2D Objects
   j. Materials
   k. Creation of Custom Materials with Image Editing Software
   l. Linking
   m. Bones
   n. Reaction Manager
   o. Mapping Coordinates and Scale
   p. Introduction to Lighting
   q. Lighting and Rendering
   r. Mental Ray Rendering
   s. Rendering and Cameras
   t. Animation
15. Non-Linear Video Editing With Premiere
   a. User Interface
   b. Project Management
   c. Importing
   d. Project Bin Organization
   e. Timeline Overview
   f. Transition
   g. Effects
   h. Titles
   i. Rendering Output
   j. Posting Videos on Portfolio Website (On Department Website)

## Methods of Instruction

**Methods of Instruction**

| Types | Examples of learning activities |
|---|---|
| Activity | Hands-on practice creating working drawings with GD&T and weld symbols, designing 3D models for printing, and producing technical animations. |
| Lab | Guided practice in integrating Autodesk and Adobe tools to create professional-level animated videos for presentation. |
| Lecture | Instructor-led presentations on Geometric Dimensioning and Tolerancing (GD&T), weldment symbology, mechanical assemblies, and 3D modeling workflows in Autodesk 3ds Max and Adobe Premiere. |
| Observation and Demonstration | Live modeling of GD&T applications in CAD software. |

**Online Adaptation**

| Types | Examples of learning activities |
|---|---|
| Activity | Students complete Autodesk Inventor and 3ds Max modeling and animation exercises, following Autodesk approved courseware. |
| Discussion | Students share rendered animation clips or screenshots for peer review, focusing on accuracy, realism, and technical presentation. |
| Lecture | Recorded demonstrations on advanced rendering techniques, animation workflows, and video editing with Adobe Premiere, with embedded quizzes. |

**Instructor-Initiated Online Contact Types**

Announcements/Bulletin Boards
Chat Rooms
Discussion Boards
E-mail Communication
Telephone Conversations
Video or Teleconferencing

**Student-Initiated Online Contact Types**

Chat Rooms
Discussions
Group Work

**Course design is accessible**

Yes

## Methods of Evaluation

**Methods of Evaluation**

| Types | Examples of classroom assessments |
|---|---|
| Quizzes | Written exams and quizzes will be given to test student knowledge on software and technical skills. Exams and quizzes will contain short answer, multiple choice, and true and false. |
| Oral Presentations | Students may give presentations on the reading assignments to the class. |
| Projects | Students may create a part or assembly specifically for printing on the 3D Printer. Scale, clearances, materials, strength, cost, and other concerns will all be taken into account of the design. |
| Class Participation | Students are required to submit reading participation assignments answering questions based on the reading prior to the lecture reviewing the material. |
| Work Assessments | Students may have lab time available during class to work on their homework. |
| Homework | Homework can be found on the assignment list handed out on the first day of class or on the department website. Homework assignments will be submitted one of the following ways: digitally, printed, or require a visual checkoff. Homework assignments will demonstrate the student's ability to successfully utilize the software and demonstrate the student's skill set. 3D Animations will be created to showcase student's skills and knowledge. |

## Assignments

**Reading Assignments**

There will be multiple reading assignments out of the class textbook. Topics may include geometric dimensioning and tolerancing (GD+T), welding drawings, gears, cams, bearings, linkages, belts, chains, couplings, and seals.

Usage of Autodesk approved courseware is required under the terms of the Autodesk Training Center agreement. Reading assignments are contained in each individual section of the Autodesk approved courseware licensed from Ascent.

**Writing Assignments**

Students will be given multiple reading participation assignments for assigned chapters out of the class textbook or supplemental reading. Question types will vary but the answers will be available in the reading. Students are to submit their written assignments at the beginning of the class the day that chapter is reviewed.

**Outside-of-Class Assignments**

Students will create a series of drawing files for digital submission or for hard copy printed submission.

Critical thinking to solve drafting problems in CAD.

Students will create a working drawing based of an existing part or assembly in a process known as "reverse engineering."

Students will modify the design of an assembly specifically for the purpose of 3D Printing.

Students will create an animated video showcasing a technical assembly. The video will be complete and professional with titles and branding. Video will be posted on their portfolio website.

## SECTION F - Textbooks and Instructional Materials

**Material Type**

Textbook

**Author**

Bertoline, G.,R., Wiebe, E.,N., Hartman, N.,W., Ross, W.,A.

**Title**

Technical Graphics Communication

**Edition/Version**

5th

**Publisher**

McGraw-Hill

**Year**

2022

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**Material Type**

Other required materials/supplies

**Description**

Software #1:
Title: AutoCAD
Publisher: Autodesk
Edition: Latest
Software #2:
Title: Inventor
Publisher: Autodesk
Edition: Latest
Software #3:
Title: 3ds Max
Publisher: Autodesk
Edition: Latest
Software #4:
Title: Photoshop
Publisher: Adobe
Edition: CS6 or higher
Software #5:

Title: Dreamweaver
Publisher: Adobe
Edition: CS6 or higher
Software #6:
Title: Premiere
Publisher: Adobe
Edition: CS6 or higher

**Material Type**

Other required materials/supplies

**Description**

1. 2" binder.
2. An external hard drive.
3. Headphones.

## SECTION G - Diversity, Equity and Inclusivity

**How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?**

This course is taught in a high-flex format, allowing students to participate in person, online, or through a combination of both, providing flexibility for diverse learning needs and personal circumstances. Multiple instructional methods, such as live demonstrations, recorded lectures, guided practice, and hands-on lab activities, ensure accessibility for varied learning styles and abilities. Students develop advanced CAD modeling, animation, and video production skills, using industry-standard tools to create projects that meet professional global standards.

## Course Codes (Admin Only)

**CB00 State ID**

CCC000306337

**CB10 Cooperative Work Experience Status**

N - Is Not Part of a Cooperative Work Experience Education Program

**CB11 Course Classification Status**

Y - Credit Course

**CB13 Special Class Status**

N - The Course is Not an Approved Special Class

**CB23 Funding Agency Category**

Y - Not Applicable (Funding Not Used)

**CB24 Program Course Status**

Program Applicable

**Allow Pass/No Pass**

No

**Only Pass/No Pass**

No