

DDGT-120: DIGITAL DESIGN GRAPHICS TECHNOLOGY 1

Effective Term

Fall 2026

CC Approval

10/03/2025

AS Approval

10/09/2025

BOT Approval

10/16/2025

COCI Approval

12/15/2025

SECTION A - Course Data Elements**CB04 Credit Status**

Credit - Degree Applicable

Discipline**Minimum Qualifications**

Drafting/CADD (Computer Aided Drafting/Design) (Any Degree and Professional Experience)

Subject Code

DDGT - Digital Design Graphics Technology

Course Number

120

Department

Digital Design Graphics Technology

Division

Career Education and Workforce Development (CEWD)

Full Course Title

Digital Design Graphics Technology 1

Short Title

Digital Design Graphics Tech 1

CB03 TOP Code

0953.00 - *Drafting Technology

CIP Code

15.1301

CB08 Basic Skills Status

NBS - Not Basic Skills

CB09 SAM Code

C - Clearly Occupational

Rationale

CTE course review per Title V requirement.

SECTION B - Course Description

Catalog Course Description

The first of a four course series in the Digital Design Graphics Technology A.S. Degree program. This course enables the student to learn and apply the fundamental skills of technical drawing towards the creation of graphical engineering documents per current industry standards. Topics covered include national and international drafting standards, drawing scales, two-dimensional and three-dimensional geometric construction, orthographic projection, auxiliary views, sectioning, dimensioning, external references, creation and modification of templates, computer-aided drafting (CAD), basic reverse engineering of parts, and three-dimensional modeling using the latest version of the Autodesk AutoCAD and Inventor Professional software programs.

SECTION C - Conditions on Enrollment

Open Entry/Open Exit

No

Repeatability

Not Repeatable

Grading Options

Letter Grade or Pass/No Pass

Allow Audit

Yes

Requisites

Advisory Prerequisite(s)

Completion of MACH-100 and TECH-92 with a minimum grade of C.

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**

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. Demonstrate the ability to create industry-standard working drawings using technical skills and the most current version of Autodesk AutoCAD software.
3. Demonstrate the ability to apply technical skills to produce professional working drawings using the latest version of Autodesk Inventor Professional.

Course Objectives**Upon satisfactory completion of the course, students will be able to:**

1. Utilize American National Standards Institute (ANSI) and International Standards Organization (ISO) drafting standards.
2. Effectively utilize engineering, architecture, and metric scales.
3. Understand the components of a CAD workstation and computer hardware components.
4. Effectively use the latest release of the AutoCAD software program in a two-dimensional and three-dimensional workspace.
5. Utilize drawing aids for entity accuracy.
6. Perform various geometric constructions.
7. Construct and edit two-dimensional and three-dimensional CAD drawing entities.
8. Effectively utilize multiple layers.
9. Construct multi-view drawings utilizing orthographic projection.
10. Utilize auxiliary view techniques.
11. Utilize sectioning techniques.
12. Represent various fasteners.
13. Create and modify detailed custom templates to industry standards.
14. Correctly dimension working detail drawings.
15. Place and edit detail drawing annotations.
16. Utilize externally referenced drawing files.
17. Print hard copies of various sized detail drawings and rendered three-dimensional models.
18. Perform efficient Computer-Aided Drafting (CAD) related file management techniques.
19. Create and modify three-dimensional CAD models.
20. Produce linear pattern developments of sheet metal pieces.
21. Create working drawings by reverse engineering simple parts.
22. Utilize the Windows operating system.

Course Content

1. Design Visualization
 - a. Drawing Types
 - b. Image Planes
 - c. Design Process
 - d. Advantages of Prototyping
 - e. Advantages of 3D Renderings and Conceptualization
 - f. Types of Views: Oblique, Isometric, and Perspective
 - g. Types of Sketches: Technical, Artistic, Working Drawings
2. CAD Workstation Components

- a. Computer Hardware: CPU, Motherboards, Memory, Hard Drives, Video Cards, Power Supplies, ROM
 - b. Computer Software: Operating Systems, GUI
 - c. Input and Output Devices: Monitors, Keyboards, Mice, 3D Mice, Tablets, Digitizers, Printers, Scanners
 - d. Storage Devices: Flash Drives, Servers, NAS, Raid Types
3. Technical Drawing Tools
- a. Typical Hand Drafting Tools: T-Squares, Triangles, Drafting Machines, Parallel Arms, Protractors, Erasing Shields, French Curves, Splines, Compasses, and Templates
 - b. Hand Drafting Best Practices
 - c. How to Use and Read Scales: Architectural, Engineering, and Metric
4. ANSI and ISO Standards
- a. Line Weights
 - b. Line Types – Alphabet of Lines and Precedence of Lines
 - c. Paper Sizes
 - d. Text Heights, Standards, and Applications
5. Engineering Geometry and Construction
- a. 2D Coordinate and 3D Coordinate Systems
 - b. Absolute vs. Relative Coordinates
 - c. World Coordinate System vs. Local Coordinate Systems
 - d. Geometric Terms: Points, Lines, Parallel, Perpendicular, Intersections, Tangency, Circle Definitions, Concentric, Eccentric, Inscribed, Circumscribed, Classification of Angles, Classification of Quadrilaterals, Polygons, Regular Polygons, Classification of Triangles
 - e. Standard Drafting Constructions: How to Bisect a Line, How to Bisect an Angle, How to Find the Center of a Radius, How to Find the Center of a Circle
6. Multiview Drawings
- a. Orthographic Projection and Best Practices
 - b. U.S. Standard Third Angle Projection vs. ISO Standard First Angle Projection
 - c. Glass Box Method, Plane of Projection, Six Principle Views and the Number of Views Actually Needed
 - d. General Layout, Construction Lines, Miter Lines
 - e. Representations of Various Types of Machines Holes
 - f. Representations of Fillets and Chamfers
7. Auxiliary Views
- a. Descriptions and Applications
 - b. Inclined Planes and Oblique Planes
 - c. Auxiliary View Classifications: Primary, Secondary, Tertiary
 - d. Partial Auxiliary Views vs. Full Auxiliary Views
8. Dimensioning
- a. Dimensioning Terminology, Standards, Applications, Symbolology
 - b. Size and Location
 - c. Types of Dimensioning: Datums, Chain, Baseline, Coordinate
 - d. Screw threads and fastener representation
 - e. Dual Dimensioning vs. Double Dimensioning
 - f. Dimensioning Guidelines
9. Section Views
- a. Definitions and Applications,
 - b. Cutting Planes vs. Viewing Planes
 - c. Dimension Placement, Alignment, Offset Distances
 - d. How to Dimension Standard Hole Types
 - e. Standard Protocol: Linetypes, Lineweight, Labels, Hatching, Omitting Lines, How to Deal With Standard Hardware, How to Section Thin and Thick Parts
 - f. Types of Sections: Full, Half, Broken, Revolved, Removed, Offset, Assembly, Auxiliary
 - g. True Sections vs. Preferred Sections
10. Tolerancing Practices for Both ANSI and ISO
- a. Tolerancing Terminology and Applications
 - b. How to Properly Apply Tolerances
 - c. Classification of Fits
 - d. Tolerance Stack-Up
 - e. Surface Symbols
11. Working in Three-Dimensions

- a. Surfaces vs. Solids
- b. Utilizing a Three-Dimensional Interface
- c. 3D Commands
- d. Boolean Operations
- e. Assemblies, Exploded Assemblies
- 12. Reverse Engineering of Simple Parts
 - a. Reverse Engineering Description
 - b. Reverse Engineering Tools
 - c. Reverse Engineering Application
- 13. AutoCAD Fundamentals
 - a. User Interface
 - b. 2D Cartesian Coordinate System
 - c. Basic Drawing and Editing Commands
 - d. Drawing Precision
 - e. Object Modification
 - f. Layer Management
 - g. Advanced Object Types
 - h. Analyzing Model and Object Properties
 - i. Advanced Editing Commands
 - j. Inserting Blocks
 - k. Layouts
 - l. Text
 - m. Hatching
 - n. Adding Dimensions
 - o. Working Effectively With AutoCAD
 - p. Accurate Positioning
 - q. Parametric Drawing
 - r. Working With Blocks
 - s. Creating Templates
 - t. Advanced Layouts
 - u. Annotation Styles
 - v. External References
- 14. Introduction to Designing in a Parametric Environment
 - a. Project Management
 - b. Creation of Linear Pattern Developments of Sheet Metal Pieces
 - c. Creation of Parts, Assemblies, Presentation Views, and Drawings
 - d. Template Creation and Modification

Methods of Instruction

Methods of Instruction

Types	Examples of learning activities
Activity	Class assignments.
Lab	Class assignments.
Lecture	Instructor lectures on assigned readings following industry standards and on Autodesk approved courseware.
Observation and Demonstration	Instructor provides computer demonstrations of best practices utilizing the class software for given assignments.
Projects	Class assignments.
Other	Class lectures and demonstrations are recorded and posted online as a student resource.

Online Adaptation

Types	Examples of learning activities
Activity	Students complete assigned CAD exercises in AutoCAD and Inventor, following step#by#step video tutorials provided in the Autodesk approved courseware.

Discussion	Students participate in online forums comparing differences between U.S. Standard Third Angle Projection and ISO Standard First Angle Projection, providing annotated visual examples.
Lecture	Recorded demonstrations of CAD tools and workflows with embedded quizzes to check understanding.

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.
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.
Exams/Tests	Final Exam will be cumulative.

Assignments

Reading Assignments

There will be multiple reading assignments out of the class textbook that coincide with the Ascent courseware instruction. Topics may include design visualization, technical drawing tools, sketching and text, engineering geometry and construction, Multiview drawings, auxiliary views, section views, and dimensioning and tolerancing practices.

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. 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. The assignments will vary in complexity ranging from a simple single view to the printing of working drawings.

Critical thinking to solve drafting problems in CAD. Students will create a working drawing based of an existing part in a process known as "reverse engineering."

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

Material Type

Other required materials/supplies

Description

Software #1:
 Title: AutoCAD
 Publisher: Autodesk
 Edition: Latest
 Software #2:
 Title: Inventor
 Publisher: Autodesk
 Edition: Latest

Material Type

Other required materials/supplies

Description

1. 3" binder or two 1.5" binders.
2. Headphones
3. USB Flash Drive

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 work with both 2D and 3D CAD environments using Autodesk AutoCAD and Inventor, building foundational skills that are transferable across global design industries.

Course Codes (Admin Only)**CB00 State ID**

CCC000201833

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

Yes

Only Pass/No Pass

No