

DDGT-240: DIGITAL DESIGN GRAPHICS TECHNOLOGY 3

Effective Term

Fall 2018

BOT Approval

05/23/2013

COCI Approval

10/15/2017

SECTION A - Course Data Elements

CB04 Credit Status

Credit - Degree Applicable

Discipline

Minimum Qualifications	And/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 (DDGT)

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

CB08 Basic Skills Status

NBS - Not Basic Skills

CB09 SAM Code

B - Advanced Occupational

Rationale

Course needs to be updated.

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. Additional topics include external references and reverse engineering of assemblies. A study of 3D Printing. Students will print to the 3D Printer 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 Not 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

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.	Obtain Autodesk Certificate of Training
2.	Ability to implement technical skills in the creation of an animated presentation utilizing the latest release of the Autodesk ds Max Design software.
3.	Ability to implement technical skills in video production utilizing the Adobe Premiere software.

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 (Fillet, 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 Accelerated)
 - 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 Serrated, 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	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.

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.
Exams/Tests	

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.

Other 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

4th

Publisher

McGraw-Hill

Year

2009

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.

Proposed General Education/Transfer Agreement

Do you wish to propose this course for a Local General Education Area?

No

Do you wish to propose this course for a CSU General Education Area?

No

Do you wish to propose this course for a UC Transferable Course Agreement (UC-TCA)?

No

Course Codes (Admin Only)

ASSIST Update

No

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