

**Course Outline**

**COURSE:** DM 61                      **DIVISION:** 50                      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Spring 2016                      **CURRICULUM APPROVAL DATE:** 10/26/2015

**SHORT TITLE:** 3D ANIMATION

**LONG TITLE:** 3D Animation

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
3	18	Lecture:	2	36
		Lab:	3	54
		Other:	0	0
		Total:	5	90

**COURSE DESCRIPTION:**

This class addresses the fundamentals of 3D animation including character modeling, soundtrack synchronization, advanced shading, lighting, rendering and compositing techniques. May include topics such as particles, dynamics, and scripting. This course has the option of a letter grade or pass/no pass. **ADVISORY:** DM 60 or equivalent experience.

**PREREQUISITES:**

**COREQUISITES:**

**CREDIT STATUS:** D - Credit - Degree Applicable

**GRADING MODES**

L - Standard Letter Grade

P - Pass/No Pass

**REPEATABILITY:** N - Course may not be repeated

**SCHEDULE TYPES:**

02 - Lecture and/or discussion

03 - Lecture/Laboratory

04 - Laboratory/Studio/Activity

05 - Hybrid

72 - Dist. Ed Internet Delayed

**STUDENT LEARNING OUTCOMES:**

1. Student will demonstrate knowledge and use of animation tools.

Measure: written exam, project

PLO: 3

ILO: 2

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

2. Student will be able to create a skeleton, add skin, shade, and render an advanced animation character.

Measure: project, performance

PLO: 3

ILO: 2, 5, 1

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

3. Student will analyze character movements and synthesize necessary joints and kinematics for realistic animation.

Measure: project, performance

PLO: 1

ILO: 2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

4. Student will create a story for animating.

Measure: storyboard, project, oral presentation

PLO: 4

ILO: 1, 2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

5. Student will be able to create steps to produce an animation clip.

Measure: project, performance

PLO: 4

ILO: 2

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

6. Student will be able to analyze an advanced character animation and determine necessary steps for its creation.

Measure: project, demonstration, exam

PLO: 4

ILO: 2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

7. Student will be able to critically apply the outline for an animation

Measure: project

PLO: 3

ILO: ,2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

8. Student will critically analyze lighting and synthesize shading effects necessary for realistic animation

Measure: project, exam

PLO: 1, 4

ILO: 2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

9. Student will be able to analyze his/her own story and synthesize an aesthetic rendition.

Measure: Project, Presentation

PLO: , 4

ILO: 2, 5

GE-LO: N/A

Year assessed or anticipated year of assessment: 2016

Program Learning Outcomes: After completing the A.A. degree or Certificate of Achievement in Digital Media you will:

PLO-1 analyze the relationship of aesthetics, content, user needs and/or interactivity of projects suitable for implementing and using digital media or order to synthesize a design, produce development guidelines incorporating techniques such as storyboards and flow charts and render their design using good design principles and contemporary digital technology.

PLO-2 be able to perform and communicate ideas within a team environment and contribute significant work related to their option area of study.

Option in Digital Art and Imaging—

PLO-3 After completing this option you will demonstrate an ability to use Digital Media technology and concepts to design, produce, and integrate aesthetically pleasing 2D/3D visual and animated material for film, video, web pages, CD/ DVDs, video games or digital print.

Option in Digital Audio/Video—

Program Learning Outcomes:

After completing this option you will be able to:

PLO-4 create and produce time-based visual art and sound.

PLO-5 analyze project definitions (including scripts or storyboards) in order to (using digital technology) creatively and logically edit video; design sound and motion graphics for broadcast or to be incorporated into web sites, CD/DVDs, video/film, video games, or cell phones.

Option in Interactive Media—

After completing this option you will be able to:

PLO-6 analyze requirements and proposals for an interactive project.

PLO-7 describe the relationship of content elements and synthesize aesthetic interactive projects such as video games, web sites, CD/DVD, educational multimedia, or interactive TV in line with current theories in human cognition.

## **CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 10/26/2015

WEEK 1-2 10 contact hours

Lecture:

Introduction to class. Discussion of requirements grading, tests,

needed supplies, and lab protocols. Review and explanation of animation software menus and tools. Polygon modeling and subdivisions.

Homework:

Read chapters 1 and 2 in text (Subdivisions and Polygon Modeling)

Lab assignment:

Become acquainted with lab hardware/software. Run the OS X tutorial.

Work through the quickstart animation tutorial.

Performance objectives:

Students will be able to describe course methodology. They will be able to operate computer hardware/software well enough to do the lab assignments. Students will be able to demonstrate knowledge of menu layout and functions that pertain to Subdivisions and Polygon Modeling. They will be able to model and paint a very simple character.

WEEK 3-4 10 contact hours

Polygon, subdivision Surface Mapping. Assigning shaders to projections. Creating and editing UV spaces. Mapping types and their implementation. Subdivision surface mapping. Using the UV texture editor. Subdivision surface character modeling. Making a basic face. Hand modeling.

Homework:

Read chapters 3 and 4 on subdivision surface character modeling and nurbs modeling.

Lab assignment:

Work through steps for modeling a basic face and hands.

Performance objectives:

Students will be able to explain polygon, subdivision surface mapping and modeling. They will be able to model a basic face and a hand using the tools mentioned above.

WEEK 5-6 10 contact hours

Lecture:

Nurbs modeling. Menus, tools. Differences from polygon modeling. Application to face features, hands, and clothing. Understanding the muscular structure of the face and the importance of modeling teeth. Using a skeleton. Understanding facial expressions.

Homework:

Read chapters 5 and 6 on facial expression and binding skins. Study for mid-term exam.

Lab assignment:

Model facial features: eyes, ears, etc. Model clothing and do steps for modeling a muscleman. Work through steps of modeling muscular structure using a skeleton and modeling teeth. Students will be able to describe various facial expressions

Performance objectives:

Students will be able to describe tools needed for nurbs modeling. They will be able too use nurbs for the modeling of facial features, hands, and clothing. They will be able to describe the importance of modeling teeth, the muscular structure of the face, and the use of a skeleton in modeling.

WEEK 7-8 10 contact hours

Lecture:

Mid-term exam.

Rigid and smooth binding. Advantages and disadvantages of each type.

Using flexors. Tools for editing smooth skin binding. Character setup.

Forward and inverse kinematics. Leg and arm control. Using IK spline

handles. Controlling body changes, eye control, and expressions.

Setting up legs. An outline for 3D character animation.

Homework:

Study chapter 7 and 8 on character setup and nonlinear animation.

Lab assignment:

Work through steps to draw a character skeleton and add skin with

clothing. Add joints to extremities. Set up legs on basic character.

Performance objectives:

Students will be able to describe advantages and disadvantages of

smooth and rigid binding. They will be able to choose proper tool for

editing skin. Students will be able to set up extremities for a basic

character animation. They will describe the outline for 3D character

modeling and animation.

WEEK 9-10 10 contact hours

Lecture:

Creating character and sub character sets. Using the Trax editor.

Manipulating clips and setting their attributes. An animated character

walk. Rendering and the use of Hypershade. Nodes and shading networks.

Homework:

Study chapter 9 on the render utility and mapping techniques.

Lab assignment:

Make a walk cycle. Add a facial expression using pose. Using the

Hypershade tool, add shading to the walk cycle character.

Performance objectives:

Student will be able to create and edit an animated clip. They will be

able to describe and use the Trax tool for editing and manipulating

clips. Student will be able to apply Hypershading to character to

create diffuse, incandescence, glow, and translucence lighting.

WEEK 11-12 10 contact hours

Lecture:

The shading network using the render utility. Setting attributes for

types of shading. Face mapping. Tools for alignment and snapping. Fluid

effects, making the dynamics simulation, and rendering. Creating ocean

effects.

Homework:

Study chapters 10, 11, and 12 essential features of 3D animation  
software and 3D painting.

Lab assignment:

Work through steps to set up shading and render a face. Work through

steps for painting effects attributes to simulate tree motion.

Performance objectives:

Students will be able to describe Hypershading and its use. They will

demonstrate fluid effects. They will be able to set and apply attributes

for a variety of shadings to a face. They will be able to paint effect attributes to simulate a moving tree.

WEEK 13-14 10 contact hours

Lecture:

How to create an animation from a story. How to model and setup a frog, bee, and a character.

Homework:

Study chapter 13, 14, 15 on modeling and animating story characters. Create your own story to animate. It should contain 2 characters and contain at least 2 scenes. Turn in storyboard next week.

Lab assignment:

Model, setup a skeleton, and bind skin for story characters. Add flexors for animation. Setup mapping for renders. Add paint effects.

Performance objectives:

Student will be able to model and animate 3 characters and visualize a short story.

WEEK 15-16 10 contact hours

Lecture:

Discussion of proposed storyboards. Workflow and expressions needed for creating/visualizing a short story. Adding a soundtrack.

Homework:

Study material needed to produce short story.

Lab assignment:

Work on short story project. Work tutorial on soundtrack creation using loop based sequencers.

Performance objectives:

Student will be able to create a story and describe necessary steps to produce an animated rendition of same.

WEEK 17 5 contact hours

Lecture:

Questions regarding story project.

Homework:

Study for final animation project.

Lab assignment:

Work on final animation project.

Performance objectives:

Students will be able to synthesize steps needed to produce a short animation.

WEEK 18 2 HOURS

Week 18 take final exam and present project.

ASSIGNMENTS:

Included in content section.

### **METHODS OF INSTRUCTION:**

Demonstrations, lectures, and study of artistic material either on-line or viewing on DVD. Readings on subject in homework assignments. In a supervised lab situation, student will work through exercises in a book, produce periodic projects, and realize a comprehensive final project

demonstrating learned concepts and techniques.

**METHODS OF EVALUATION:**

The types of writing assignments required:

Written homework

Reading reports

Other: Storyboards

The problem-solving assignments required:

Exams

Other: Project development

The types of skill demonstrations required:

Class performance

Performance exams

The types of objective examinations used in the course:

Multiple choice

True/false

Matching items

Completion

Other category:

None

The basis for assigning students grades in the course:

Writing assignments: 20% - 30%

Problem-solving demonstrations: 40% - 60%

Skill demonstrations: 10% - 20%

Objective examinations: 20% - 25%

Other methods of evaluation: 0% - 0%

**REPRESENTATIVE TEXTBOOKS:**

Paul Naas. Autodesk Maya 2014 Essentials. Sybex, 2014. Or other appropriate college level text.

ISBN: 978-1-118-57507-9

Reading level of text, Grade: 10+ Verified by: Robert Beede

Other textbooks or materials to be purchased by the student: Lynda.com Video Tutorials

**ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 200630

UC TRANSFER:

Not Transferable

**SUPPLEMENTAL DATA:**

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable  
Special Class Status: N  
CAN:  
CAN Sequence:  
CSU Crosswalk Course Department: DM  
CSU Crosswalk Course Number: 61  
Prior to College Level: Y  
Non Credit Enhanced Funding: N  
Funding Agency Code: Y  
In-Service: N  
Occupational Course: D  
Maximum Hours:  
Minimum Hours:  
Course Control Number: CCC000276439  
Sports/Physical Education Course: N  
Taxonomy of Program: 061440