

COURSE OUTLINE

**Art 235
3-D Character Animation**

I. Catalog Statement

Art 235 provides students with three dimensional (3-D) character animation training. The course begins with a thorough review of the animation toolset. Equal emphasis is placed on technical competence and aesthetic sensitivity. Topics covered include animation controls to pose a character, forward and inverse kinematic animation, keyframes and breakdowns, timing and movement, and audio/dialog track.

Total Lecture Units: 2.0

Total Studio Units: 1.0

Total Course Units: 3.0

Total Lecture Hours: 32.0

Total Studio Hours: 32.0

Total Faculty Contact Hours: 64.0

Recommended Preparation: ART 230 or equivalent.

Note: Current industry standard digital animation software (Maya) will be used.

II. Course Entry Expectations

Prior to enrolling in this course, the student will be able to:

1. operate essential user interface devices, such as camera and transformation tools;
2. apply basic modeling tools and techniques;
3. apply basic rendering tools and techniques;
4. apply basic animation tools and techniques;
5. analyze and edit modeling, rendering, and animation data using designated spreadsheets/windows;
6. describe image output.

III. Course Exit Standards

Upon successful completion of the required course work, the student will be able to:

1. pose the skeleton of a 3-D character;
2. create a simple character animation by key-framing two basic poses;
3. animate a biped character walking using 4 poses and at least 4 key-frames;
4. animate a biped character jumping using 7 poses and at least 7 key-frames;
5. animate a biped character running using hierarchical key-frame animation technique;

6. animate a biped character dancing using hierarchical key-frame animation technique;
7. analyze biped motion and be able to recreate it using 3d animation techniques.

IV. Course Content

Total Faculty Contact Hours: 64

- | | |
|--|------------------------|
| <p>A. Character Hierarchy and Control</p> <ol style="list-style-type: none"> 1. The root locator 2. Back and neck joints 3. Arms 4. Selection modification 5. Set driven key and indirect controls 6. Things not to do with joints | <p>Lecture 5 hours</p> |
| <p>B. Posing a Biped Character</p> <ol style="list-style-type: none"> 1. The root locator 2. Legs and knees 3. Back joints and distribution of weight 4. Arm joints 5. Hand controls 6. Neck joints | <p>Lecture 5 hours</p> |
| <p>C. Keyframe Animation</p> <ol style="list-style-type: none"> 1. Definition of a key-frame 2. The graph editor and dope sheet 3. Maya Embedded Language (mel) scripts 4. Key-frames 5. Key-framing poses 6. Animation preview | <p>Lecture 6 hours</p> |
| <p>D. Analyzing Motion</p> <ol style="list-style-type: none"> 1. Trajectory of pelvis 2. Relationship of placement of feet to disposition of pelvis 3. The “inside out” model of the kinetics of the upper body | <p>Lecture 4 hours</p> |
| <p>E. Problem Solving</p> <ol style="list-style-type: none"> 1. Key-frames problems <ol style="list-style-type: none"> a. posing b. timing c. motion arcs 2. Animation problems <ol style="list-style-type: none"> a. writing over key-frames b. deleting and copying key-frames c. editing curves | <p>Lecture 4 hours</p> |
| <p>F. Working with Audio</p> <ol style="list-style-type: none"> 1. Importing audio 2. Audio file types | <p>Lecture 4 hours</p> |

3. Viewing audio in timeline
4. Animating in time with audio

- G. Animating Blendshapes Lecture 4 hours
1. Pose-based facial animation
 2. Muscle-group based facial animation
 3. Blendshape animation
 4. Time with audio
- H. Laboratories Emphasizing Technical and Aesthetic development Studio 32 hours

V. Methods of Instruction

The following methods of instruction may be used in this course:

1. lectures and demonstrations;
2. instructor critique of student work;
3. peer critique of student work;
4. individual instruction of students in a computer lab.

VI. Out of Class Assignments

The following out of class assignments may be used in this course:

1. blocking out a character animation;
2. creating key frames for facial animation and lip sync;
3. creating key frames for body animation.

VII. Methods of Evaluation

The following methods of evaluation may be used in this course:

1. evaluation of projects and assignments;
2. midterm and final examinations;
3. evaluation of final project.

VIII. Textbook

"Autodesk Maya." *Autodesk Knowledge Network*. Autodesk Inc. n.d. Web. 8 May 2014.
9th Grade Reading Level.

"Maya Learning Channel." *YouTube*. YouTube. n.d. Web. 8 May 2014.
9th Grade Reading Level.

IX. Student Learning Outcome

Upon successful completion of the required coursework, the student will be able to:

1. animate a character using 3-D animation techniques.