

COURSE OUTLINE

Art 233 Character Set-up - Kinematics

I. Catalog Statement

Art 233 provides students with training in character set-up techniques. The course begins with a thorough review of the animation and character set-up toolset. Skills taught include installation of the skeleton within wireframe mesh, establishment of animation controls such as inverse kinematic (IK) handles and set-driven-key relationships, and binding of mesh to skeleton using rigid and smooth models.

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. install, label, orient, and use joints inside a character skin;
2. bind the skin of a character to the joint hierarchy and edit skin weighting;
3. install, label, and use IK handles and pole vector constraints;
4. set up the reverse foot control system;
5. establish set driven key relationships.

IV. Course Content

Total Faculty Contact Hours = 64

- A. Working With Joints Lecture 8 hours
 - 1. The draw joints tool
 - 2. Native hierarchy
 - 3. Local axial orientation
 - 4. Modify prefix hierarchy names
 - 5. Rotation as a numerical function
 - 6. Integrated hierarchy

- B. Working with IK Handles Lecture 8 hours
 - 1. Anatomy of IK system
 - 2. Function of IK handle
 - a. Mammalian joint rotation
 - b. Animation of friction
 - 3. The IK handle
 - 4. Rotate plane vs. Single Chain IK
 - 5. Pole vector constraints

- C. Creating the Reverse Foot Lecture 8 hours
 - 1. Control joints setup
 - 2. Control joints orientation
 - 3. IK handles and control joints
 - 4. Functionality

- D. Set Driven Key Lecture 4 hours
 - 1. Limits on attributes
 - 2. The set driven key concept
 - 3. The set driven key window
 - 4. The importance of local axial orientation
 - 5. Functionality

- E. Binding Skin Lecture 4 hours
 - 1. Smooth bind vs. rigid bind
 - 2. Theory of binding
 - 3. The paint skin weights tool
 - 4. The component editor
 - 5. Influence objects
 - 6. The bound character

- F. 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. drawing a skeleton inside a 3-D digital character mesh;
2. weighting the skin of a character mesh with respect to the skeleton;
3. creating animation control systems;
4. performing animation tests.

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. 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. set up a simple character.