SECTION A - Course Information

1. Course ID: ANIM 149
2. Course Title: 3-D Character Rigging
3. Division: Arts Division
4. Department: Commercial and Entertainment Arts
5. Subject: Art: Animation
6. Short Course Title: Character Rigging
7. Effective Term: Summer 2014

SECTION B - Official Course Information

1. Recommended Class Size:
   a. Maximum Class Size: 25

2. Method of Instruction:
   □ Lecture
   □ Laboratory
   ○ Lecture and Laboratory
   □ Independent Studies
   □ Distance Learning (Distance Education Delayed) for online courses.
   □ Work Experience, Occupational
   □ Work Experience, General
   □ Open Entry/Exit
   □ Distance (Hybrid Online) for online supported courses

3. Contact Hours for a Term:
   Note: If not a variable unit/hour course, enter the hours in the "Low" column only. Leave the hours in the "High" column blank.
   Low                  High
   Lecture:             36.00  To
   Lab:                 71.00  To
   Activity:            To
   Clinical:            To
   Total Hours:         107  To

4. Credit Units: 3.00 To

1 Unit of credit per eighteen (18) hours of lecture contact hours for a term
1 Unit of credit per fifty-four (54) hours of lab, activity or clinical contact hours for a term

5. Taxonomy of Programs (TOPS) Information:
   a. TOPS Code and Course Program Title:
061440 - *Animation

b. Course Control Number:

(To be entered by the Instruction Office Only.)

6. SAM Priority Code:(Select One)

☐ Apprenticeship
Courses offered to apprentices only.

☐ Advanced Occupational
Courses taken in the advanced stages of an occupational program. Each “B” level course must have a “C” level prerequisite in the same program area.

☐ Clearly Occupational
Courses taken in the middle stages of an occupational program. Should provide the student with entry-level job skills.

☐ Possibly Occupational
Courses taken in the beginning stages of an occupational program.

☐ Non-Occupational

7. Please place this course into the appropriate discipline by selecting from the drop down list. The discipline placement indicates what preparation is needed to teach the course. Discipline faculty may place their courses into more than one discipline as appropriate:

Commercial
Art

8. General Course Information

a. Course Credit Status: D Credit – Degree Applicable
b. State Transfer Code: C1 Not Transferable, AA/AS Degree
c. State Classification Code: A Liberal Arts/Sciences Degrees
d. Basic Skills Status/Level: N Not a Basic Skills Course
e. Sports/Physical Education Course: ☐ Yes

(Only check here if the course is a physical education course.)
f. Grading Method: Letter Grade Only
g. Number of repeats allowed: Non-repeatable Credit (equates to 0 repeats)
h. Overlap/Duplicate Course:

9. Course Preparation:

Note: If this course has a new requisite, a content review supplemental form must be completed.

☐ Prerequisite
ANIM 145
10. Course Special Designators

11. Course Program Status

☐ Program Applicable  ☐ Stand-alone

12. Funding Agency Category:

☐ Not Applicable

☐ Primarily developed using economic development funds

☐ Partially developed using economic development funds

SECTION C - Transfer Status

Baccalaureate Status is granted by the Educational Design General Education and Baccalaureate Level Subcommittee.

☐ CSU Transferable  Approval Date:

☐ UC Transferable

SECTION D - General Education Request

Mt. San Antonio College and CSU General Education course approval are submitted to the Educational Design GE and BL Subcommittee for approval.

1. The Articulation Officer submits the course directly to the CSU Chancellor for approval.

2. Upon receiving approval, the course is approved for the Mt. SAC Associate Degree GE and placed in the area(s) CSU approval indicate(s).

☐ Yes  ☐ No  Approved for inclusion on Mt. SAC and CSU General Education List?

1. Mt SAC General Education Applicability:

2. CSU General Education Applicability (Requires CSU approval):

3. IGETC Applicability (Requires CSU/UC approval):
SECTION E - Course Content

1. Course Descriptions

a. Catalog Description

The principles, techniques and processes of 3D character rigging.
Character Rigging is the industry technique of setting up controls on a 3D mesh so that it is animatable. The principles, techniques and processes of 3D character rigging as done primarily for computer games and movie industry will be explored.
Building a set of animatable character rigs built using forward kinematics, inverse kinematics, constraints, expressions, blend shapes among other techniques. No prior knowledge of rigging is necessary for this class.

b. Class Schedule Description:

☐ Yes ☐ No Is a course description to be printed in the Class Schedule?

The principles, techniques and processes of 3D character rigging.

2. Course Outline Information

a. Lecture Topical Outline:

- Relationships (parenting, grouping), joints, simple constraints, inverse kinematics (IK) types
- Creating skeletons
- Humanoid rigging techniques: leg and arm setup
- Inverse kinematics
- Quick binding of skin
- Designing skeletons for organic models
- Humanoid rigging techniques: spine and head setup
- Designing NURB s (Non-uniform rational basis splines) based handles
- Constraints
- Quadruped Rig: 4-legged animal rigging techniques
- Designing the quadruped skeleton
- Rigging the quadruped legs, flexible spine, head, and tail
- Rigging hard objects
- Vehicle rigging design: the suspension, wheels, doors
- Rigid binding of mesh parts to joints
- Naming parts correctly
- Vehicle rigging design for a game rez mesh: the suspension, wheels, doors
- Skinning and painting weights on organic and inorganic models
- Set driven keys, connection editor, channel control
- Core and superficial controls
- Analyzing meshes, and the rigging techniques needed
- Expressions, setting limits
- Core and superficial rigging
- Creating control panels
- Sliders, pinion and axle, piston
- Creating morph targets for facial rigging
- Cleaning up the rigging
- Making rigs bullet-proof and water-tight
- Recording video to create your rigging reel
- Final exam
b. Lab Topical Outline:

- Creating simple point/orient-constrain rigs for 3 ultra-simple characters
- Setting up skeleton and arm + leg rigging on generic humanoid model
- Humanoid rigging
- Creating the quadruped skeleton
- Creating the quadruped leg rigging
- Creating rigging for the quadruped spine, tail, head, and neck
- Creating rigging on a simple primitives-based truck suspension, wheels, doors
- Creating rigging on a typical game rez truck mesh: suspension, wheels, doors, and other mobile parts
- Skinning and painting weights on the quadruped mesh
- Creating keys, connection editor, truck mesh
- Using expressions, setting limits
- Creating control panels
- Creating sliders, pinion and axle, piston
- Creating morph targets on a generic mesh
- Cleaning up the rigs
- Creating screen captured video: editing, title cards, and music track
- Presenting the final reel
- Final exam

3. Course Measurable Objectives:

1. Design rigging schemes for animating models from a 3D game-rez mesh.
2. Distinguish locations where various types of constraints would be applied on the rig.
3. Distinguish what types of skinning methods - rigid, smooth, or a combination - would be applicable for particular mesh groups.
4. Create meshes that accurately deform when joints are manipulated.
5. Create rigs usable for character animations.

4. Course Methods of Evaluation:

Category 1. Substantial written assignments for this course include:

If the course is degree applicable, substantial written assignments in this course are inappropriate because:

The subject is related to practical applications using the 3D software, Maya. So the knowledge gained is to be demonstrated purely by applying the skills directly in the medium of the 3D software.

Category 2. Computational or non-computational problem solving demonstrations:

Demonstrate smooth and rigid skinning on two separate meshes, based on its appropriateness
Criteria reviews on the effectiveness of the two final rigs created in the following areas: mesh deformation, limb articulation, seaworthiness for animation.

Category 3. Skills Demonstrations:

Demonstrate the effectiveness of the character rig created, by manipulating the limbs, spine, and other body parts; and seeing a realistic result in how the mesh deforms as a result of the manipulations.

Category 4. Objective Examinations:

NA

5. Sample Assignments:
1. Apply skinning and weight-painting techniques to a hard surface mesh, and an organic mesh.

2. Create rigging for the forelimbs of a quadruped animal.

3. Create a suitable control scheme for a vehicle rig.

6. Representative Text:

   **Book 1:**
   
   **Author:** David Rodriguez
   **Title:** Animation Methods - Rigging Made Easy
   **Publisher:** Ragin 3D
   **Date of Publication:** April 18, 2013
   **Edition:** Character in Maya