

The Art Institute of California—San Francisco
Course Syllabus

Course Number: GA4435

Course Title: Advanced Game Modeling and Texturing

Class Meetings: Mondays from 6-10pm, rom 015 1170Mkt

Session/Year: Summer 2011

Instructor Name: Andrew Klein

Email Address: amklein@aii.edu

Phone: not available

Website: www.kleinmakelearngood.com (has all the course notes)

Instructor Availability Outside of Class:

-1 tutoring hour per week, first come first serve: Mondays 5-6pm, room 015

-1 office hour per week, first come first serve: Thursdays 5-6pm, room 401

Course Description:

In this course students will continue to develop their skill set with regards to next-generation game platforms. Students will focus on creating art assets for a next-generation pipeline. Using a variety of tools that are available for the market, students will study and apply advanced LOD modeling, normal mapping, shaders and advanced real-time texturing solutions. This course also includes an introduction to effects within a game engine.

Course Length:	11 Weeks
Lecture/Lab hours:	22 Hours / 22 Hours
Contact Hours:	44 Hours
Credit Hours:	3

Course Competencies:

Upon successful completion of this course, the student should be able to:

- Demonstrate the use of a variety of different shader solutions
- Use procedural textures to simulate several different organic and hard surface textures
- Apply advanced modeling techniques, to both asset creation and world space modification
- Understand the proper layout of instances to create a feeling of mood and organic flow within an environment
- Create in-engine effects appropriate to a variety of different natural and artificial phenomena

Course Prerequisites: GA2212 Game Modeling & Animation

IT IS HIGHLY RECOMMENDED THAT STUDENTS ENTERING THIS COURSE HAVE ALREADY TAKEN AND PASSED: Advanced Texturing and Lighting, Character Modeling, and Rigging 1.

Required Textbooks (choose 1):

- Zbrush Character Creation: Advanced Digital Sculpting, Scott Spencer **SPENCER1**
- Zbrush Digital Sculpting: Human Anatomy, Scott Spencer **SPENCER2**
- Zbrush 4 Practical Guide PDF **ZBRUSH GUIDE**
- 3d Game Textures: Create Professional Game Art Using Photoshop, Luke Ahearn (ed 2)
- Essense: The Face, Ballistic Publishing
- Character Modeling 3, Ballistic Publishing

Materials and Supplies: Pens and paper for note taking. USB or firewire hard drive, multiple CD/DVD-R. A Wacom tablet (Intuous 3 or 4 preferred). Tablets can be checked out from the cage on the 6th floor.

Method of Instruction: Lecture and Lab

Estimated Homework Hours: 4-8 hours per week

Technology Needed:

Hardware: PC computer, Wacom Tablet (Intuous preferred)

Software: Zbrush 4, Maya 2011, Photoshop CS4 or CS5, Autodesk Mudbox 2011, 3dCoat, xNormal, Crazybump

Grading Scale:

All assignments must have clear criteria and objectives to meet. All students shall be treated equitably. It will be that student's right to know his/her grade at any reasonable point that information is requested by that student. The criteria for determining a student's grade shall be as follows (on a percentage of total points basis):

A	100-93
A-	92-90
B+	89-87
B	86-83
B-	82-80
C+	79-77
C	76-73
C-	72-70
D+	69-67
D	66-65
F	64 or below

Process for Evaluation:

Students can use the following breakdown to determine their final grade.

Attendance	11 points
Fish Project	12 points
Tombstone	18 points
Midterm (head or 7-10 themed props)	48 points
Creature Sculpt/Normal/Displacement	31 points

For a more complete look, visit:

<http://www.andrewklein.net/bh/zbrush.html>

Student Evaluation/Grading Policies:

- Class time will be spent in a productive manner.
- Grading will be done on a point system.
- Points for individual activities will be announced.
- All work must be received by the set deadlines.
- ABSOLUTELY NO WORK WILL BE ACCEPTED AFTER THE FINAL CLASS MEETS WEEK 11.

Classroom Policy:

- No food allowed in class or lab at any time. Drinks in sealable bottles allowed in classroom.
- Edible items brought to class or lab must be thrown out.
- If student elects to eat/drink outside class or lab door, missed time is recorded as absent.
- Attendance is taken hourly. Tardiness or absence is recorded in 15-minute increments.
- Break times are scheduled by the instructor at appropriate intervals.
- No private software is to be brought to lab or loaded onto school computers.
- No software games are allowed in lab (unless in course curriculum).
- Headphones are required if listening to music during lab. No headphones are allowed in lecture.
- Any student who has special needs that may affect his or her performance in this class is asked to identify his/her needs to the instructor in private by the end of the first day of class. Any resulting class performance problems that may arise for those who do not identify their needs will not receive any special grading considerations.

Disability Policy Statement:It is our policy not to discriminate against qualified students with documented disabilities in its educational programs, activities, or services. If you have a disability-related need for adjustments or other accommodations in this class, contact the Disabilities Services Coordinator at 415-276-1060.

Academic Honesty Policy:

Students are expected to maintain the highest standards of academic honesty while pursuing their studies at AiCA-SF. Academic dishonesty includes but is not limited to: plagiarism and cheating; misuse of academic resources or facilities; and misuse of computer software, data, equipment or networks.

Student work that appears to violate AiCA-SF's standards of academic honesty will be reviewed by the Committee on Academic Honesty. If the work is judged to have violated standards of academic honesty, appropriate sanctions will be given. Sanctions include but are not limited to course failure and academic termination.

Quarter Credit Hour Definition:

A quarter credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates not less than:

- (1) One hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for 10-12 weeks, or the equivalent amount of work over a different amount of time; or
- (2) At least an equivalent amount of work as required in paragraph (1) of this definition for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

Weekly Outline:

Week 1: Lecture: *Learning the Zbrush Interface.*

We will discuss the difference between Zbrush and more traditional 3d modeling programs. We will talk about documents versus tools and how tools, materials, colors, and alphas can be painted. We will also cover the difference between the Edit (3d) and Illustrative (2d) environments.

Lab: INTRO PROJECT--THE ZBRUSH TOOLSET-Use Shadowbox to create a simple mesh in the shape of a fish. Sculpt the fish using a variety of brush techniques. Use the transpose tool and snapshot function to create a school of fish.

Homework, Project 1: Finish your fish sculpt-pose-school, Due week 2.

Reading: PG: 1-27 **SPENCER1**, Read the notes on the website for week 1.

Week 2: Lecture: *The Projection Master, Zbrush Pipeline Basics*

We will discuss Zbrush's 2.5d capabilities via the Projection Master. Creating and using Alphas for sculpting. We will be discussing the basics of the Maya to

Zbrush to Maya pipeline for rendering. Normal Mapping will be introduced, and rendering Normal Maps in Maya will be covered. Using the Planar brush set, and the noise features of zbrush. Tiling Normal Maps with Zbrush and CrazyBump.

Project 2: Create your own tombstone. Create color map from displacement crop and fills, create normal map, export and render in maya. Due week 3.

Reading: PG: 111-137 **SPENCER1**, Read the notes on the website for week 2.

ALSO, You need to start thinking about the Midterm Project:

Project 3: You will be given the choice one of the following:

Character Modelers will have the option to create a Self-Portrait Head in Maya using photos (NO WEB PHOTOS ALLOWED).

Projection Painting techniques will be used to create the color texture, then inflating techniques will be used to sculpt from that photo. You will be allowed **ONE 2048 Map for each channel on the head, and ONE 512 Map for each channel for the hair.**

Environment Modelers and Game Artists will have a corresponding option to create a "set" made from 7-10 objects with a poly limit of 8,000 tris. These objects will each be made ready with color, normal and specular maps for each asset. All projects must be rendered in Maya or exported to a game engine for screenshots. **TWO 1024 Maps (or equivalent smaller) must be used for each channel for ALL PROPS COMBINED.**

Only one project track needs to be taken, but your track needs to be decided, with reference material ready by week 3!

Week 3: Lecture: *Introduction to Projection Painting*

We will examine 4 projection painting techniques.

Lab: Practice Spotlight, Zaplink, Mudbox, and Photoshop 3d.

Homework: continue midterm assignment

Reading: PG: 148-173, Read the notes on the website for week 3.

Week 4: Lecture: *Inflating and Tiling Techniques*

We will examine how to use Alphas for UV-based inflation sculpting. We will also look at 2 techniques for creating tileable normal maps, 1 using Maya, 1 using Zbrush.

Lab: Continue working on Midterm

Homework: Continue on Midterm

Reading: PG: 248-287 Read the notes and watch the videos on the website for week 4.

Week 5: Lecture: *Displacement maps in Maya, Using xNormal*

We will examine Displacement mapping in detail, and also look at how to use xNormal to generate Normal Maps.

Lab Time: Use this week as Lab time to finish up your Head or Env. Models and Textures. Progress samples, renders, screenshots will be requested in class for evaluation of your midterm grade.

Week 6: Lecture: *Midterm Critique* As we examine each other's work for the first

half of the semester, be prepared to talk about the techniques you used and any problems you met. **PARTICIPATION IS MANDATORY!** Discussion and peer to peer conversation will be highly encouraged.

Homework: Finish your projects based on the feedback received.

Reading: PG: 175-191

Week 7: Lecture: *Sculpt First Workflow using Zbrush and 3dCoat*

We will discuss Zspheres and determine how to use the adaptive skinning process to quickly create a base mesh. We will look at Zsketching, and the unified skin process. Finally we will talk about Zbrush 3.1's Subtools, Morph Targets, and Retopologization.

Lab: Create basic Zsphere character using Zspheres, Link Spheres, and Attractor Spheres. Zsketch to add form. Skin, and retopo.

Project 3: Creating a creature.

REQUIREMENTS:

- Use Zspheres and the Retopologization process to the start the character
- Finish Modeling in Maya, add subtools for clothing/props as needed
- UV with optimization for **2x 2048 Maps (for each channel)**
- Sculpt according to motif and your drawings
- Create Normal Map, fix all tangent space seams

Reading: PG: 76-109, week 7 notes on website

Week 8: Lecture: *Sculpting.*

The primary focus of the week will be on sculpting techniques. We will examine additional brushes that can be downloaded and used for extra detail.

Lab: practice sculpting.

Homework: Continue working on final.

Reading: PG: 29-73, week 8 notes and videos on website.

Week 9: Lecture: *Normal map theory, fixing normal maps*

We will discuss the theory of normal mapping and its applied practice, using this knowledge to help fix normal map seams.

Lab: Work on Character

Homework: Continue sculpting

Reading: PG: 138-145, 289-293, week 9 notes on website.

Week 10 : Lecture: *Subtool Master,Transpose Master, Mudbox*

We will look at these unique plugins for zbrush that allow you create poses inside of Zbrush without exporting to external applications. We will also examine Mudbox in greater detail, and look at how it stacks up against Zbrush. Emphasis will be on transferring knowledge of one software platform into another to give you multiple tools to choose from.

Lab: Practice posing a character

Homework: Finish project.

Reading: PG: 194-221 week 10 notes on the website.

Week 11 : Final Critique for all those not graduating. The same rules apply as the midterm crit. Bring 3+ renders, a .ztl file, a maya file, document exports, and texture maps **MISSING THIS CRITIQUE MEANS YOU WILL FAIL THIS CLASS.**