
Objective

This course will study the aesthetic development and technical implementation of creating unique, compelling, and intuitive 3d asset creation for games. The course also addresses the use of 3d datasets with hand-on experience of research, breakdown, and construction of these assets for the next-generation marketplace.

Concepts

Regardless of artistic background, students will have an opportunity to exercise both design and technical skill with 3d modeling and texturing, emphasizing clear visual communication and quick revision. This is done with an awareness of the collaborative processes in real-world game development. Through lectures, guided exercises, group critiques and workshops, participants will reinforce solid design fundamentals while attempting to push the creative possibilities of visual game design for the 21st century.

Each student will work on a group visual game design portfolio, creating assets for props, characters and environments. This workshop also works in tandem with other classes to utilize these data sets for student projects within CS Games.

Prerequisite

Open to all students

Lecture

3 hours total (3 Units)

Grading

The following point structure will be used in determining the grade for the course. Final grade will be based upon the total points received.

Class attendance/Discussion	100
6 Skill Projects (50 points)	300
Group Design	300
Individual Design	300
<hr/> TOTAL POSSIBLE	<hr/> 1000

Policies

Late Midterms: Rules for late midterm will be established by the instructor.

Attendance: Must attend every class. If absence is not sufficiently excusable, then student will lose a percentage grade. Due to the nature of the class, it is not possible to 'make up' an entire lecture for a student that has not attended, since asking for a replay of three hours of lecture or Maya instruction to an individual is unreasonable. The student needs to find someone who can relay the information to them.

Academic Integrity

The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student, and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. It is often difficult to distinguish between a culpable act and inadvertent behavior resulting from the nervous tension accompanying examinations. When the instructor determines a violation has occurred, appropriate action, as determined by the instructor, will be taken. Though working together is encouraged, the projects must be your own effort. "Duplicate" projects will all receive zero points and possible referral to the Office for Student Conduct.

All students should read, understand and abide by the University Student Conduct Code
<http://www.usc.edu/dept/publications/SCAMPUS/governance/gov03.html>

Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Pipelines for Games and Interactives

CS 281 (3 Units)

Week 1- Lecture: Class Introduction/Overview -

- What class provides
- Maya software
 - Rules for using lab
 - Place to download Maya if using personal laptop
 - Follow-up E-mail from TA
- Review Team Projects
 - Team captains roles/responsibilities
- Online resources
 - OAD (Online Asset Database)
 - Excel sheet checklist

Week 2 – Lecture: Begin Maya Modeling –

- Maya Basics

- Camera control
- Five basic geometry shapes
- Extrusion, Addition and deletion of geometry (objects)
- Manipulation of components (vertices, edges, faces)
- begin building Phantasm Ball in class (modeling)
 - Corresponding video on class website

Week 3 – Lecture/Assignment: Finish Maya Modeling –

- Lecture to finish up the 3d modeling of Phantasm Ball
 - Review of principles of geometry manipulation in 3d
 - Grouping, not combining for UV texturing
 - Cleaning up scene
- Assignments Due: Phantasm Ball 3d model (not to be turned in, but prepped for texturing)

Week 4 – Lecture: Begin UV texturing the Phantasm Ball –

- Principles of UV mapping
 - Cartography comparisons (flaying a 3d into 2d)
 - Compromise UV layout vs slicing UVs
- In-class assignment of sphere UV cutting/layout
 - Download 'Dogbunny' from OAD, manipulate UVs
- Phantasm Ball texture provided on website

Week 5 – Lecture/Assignment: Finish texturing the Phantasm Ball -

- Phantasm Ball UV layout finish (in class)
 - Review of what to hand in
 - All Maya files saved as ASCII (.ma)
 - All images saved as 512 x 512 .jpg
 - One object, one texture
 - How/where/when to hand it in
 - Follow-up Email from TA

Week 6 – Lecture: Shoebox Garage –

- Lecture of using 2D blueprints to model 3D vehicle
- Go to theblueprints.com
 - Review website for good/bad examples of modeling blueprints
 - No shaded wireframes
 - No color
 - Four views
 - Simple designs
- Choose blueprint for vehicle
- In-class setup of 'shoebox garage' for modeling accuracy
- In-class begin building vehicle
 - Lab time for class to begin modeling their vehicle
- Assignments Due: Vehicle 3d model (not to be turned in, but prepped for texturing)

Week 7 – Lecture: Using images for textures on vehicles –

- How to save out UV map of 3d model from Maya
- Class lecture on finding online texture for vehicle
 - Examples of good/bad textures

- Inconsistent color/lighting
 - Perspective (warped) angles
- Examples of how to download/use image
- In-class examples of grabbing texture and basic manipulation
 - Using Photoshop
 - Using Pixlr
- Assignments Due: Vehicle 3d model (modeled, textured)
 - Review of what to hand in
 - One object, one texture
 - How/where/when to hand it in
 - Follow-up Email from TA

Week 8 – Midterm Assignments –

- Teams chosen from class
 - Team Captains
 - Team Names
- Review of checklist usage for class
- Team decides what to model from Natural History Museum
 - Review of necessary items to go to NHM
 - Field trip for teams to go to NHM, find/research items for modeling
- Assignments Due: individual item models from team members
 - (not to be turned in, but prepped for texturing)

Week 9 – Midterm Lab

- In-class lab time to finish modeling and texturing individual models
- Assignments Due: individual item models from team members
 - Review of what to hand in
 - One object, one texture
 - How/where/when to hand it in
 - Follow-up Email from TA

Week 10 – Lecture: 3d Props and lighting –

- Examples of 'baked lighting' for models in video games
 - Real-time lighting and shadows in console vs mobile games
 - Normal maps
- In-class demonstration of Maya baked light as texture map
 - Labtime for students to do example using 3d sphere
- Assignments Due: prop model (modeled, textured)
 - Review of what to hand in
 - One object, one texture
 - How/where/when to hand it in
 - Follow-up Email from TA

Week 11 – Lecture: Organic (Avatar) modeling –

- Character Assignment
- Modeling organic versus 'statue' modeling
 - Modeling for deformation
- In-class assignment of fusing two cylindrical pipes smoothly at skew angle
 - Concentric blending for arms/legs of characters

- Assignments Due: individual 'selfie' shots for modeling and 'Shoebox Garage' setup
 - (not to be turned in, but prepped for texturing)

Week 12 – Organic (Avatar) texturing –

- Lecture on Maya Projection texturing
 - Projection vs. painting on UVs
 - Baking the projection into UV map
 - In-class example using sphere
- Projection or UV painting choice for avatar models
- In-class Lab time to texture avatar model
 - Review of what to hand in
 - One object, one texture

Week 13 – Lecture: Uploading models to the OAD database –

- Uploading to the OAD
- Exporting FBX from Maya
- Quicktime viewer outside of Maya to verify model
- In-class assignment of exporting/viewing previous assignments
- How to .zip up exports for upload
 - Obj.ma + image.jpg/Obj.fbx + image.jpg
 - Handing in previous assignments to the OAD
 - Cleaned up
 - Verifying
 - Report of incorrect uploads for deletion
- In-class Lab time to upload all models

Week 14 – Finals assignments –

- Assignments for Mobile Games Classes (CS 526) and AGP (CS 491) classes to teams
- Teams now autonomous
 - In-class lab time for teams to begin modeling assignments
 - Individual tutoring from instructor to teams and students

Week 15 - Finals Due-

- Assignments Due: Team models (modeled, textured)
 - Turned in, verified and uploaded to OAD
 - Follow-up Email from TA