Course Objective

The objective of this course is to model and texture 3D models for use in interactive entertainment. Emphasis on the technical process as well as laying out unique plans per assignment in both individual and team environments to gain knowledge of this necessary part of 21st century interactive media.

After successfully completing this course, students should be able to:

- Know the features of mobile games, the workflow of mobile game development and how mobile gaming technologies work;
- Create mobile game apps on mobile devices such as Apple iPhone, using proper technologies;
- Communicate and work effectively with teammates including artists, designers, and programmers.

Course Description

Students in this course will work in small teams to build games on mobile devices. The initial half of the course will focus on learning mobile game development tools and how those can be utilized with game development. During the course, students will collaborate with each other through the use of
programming, art, design, and production skills.

**Recommended Preparation:** Basic mobile game apps development technologies (Unity3D, Cocos2D), teamwork tools (Google shared docs, Skype, SVN), languages (C#, Objective C, C++, Javascript)

**Textbook:** Course Notes and technical documentation.

**Evaluation of student performance**

<table>
<thead>
<tr>
<th>Weekly</th>
<th>Deliverables</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term</td>
<td>Deliverables</td>
<td>15</td>
</tr>
<tr>
<td>Final</td>
<td>Deliverables</td>
<td>25</td>
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<tr>
<td>Final</td>
<td>Presentation</td>
<td>10</td>
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<tr>
<td><strong>Total:</strong></td>
<td></td>
<td>100</td>
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Mid-term and Final Project/Presentation evaluation will be based on how a project will realize the goals the team has set out for itself and the project. Ultimately, this course exists to empower students to bring their vision onto the screen. The more you put into the project, the closer it will be to what was envisioned. For the Weekly Deliverables, the results of the online color-coded schedule sheet will be a key input. The professors will evaluate both the amount of tasks fully completed on time and also the complexity of the tasks.

More specifically:

a) Weekly deliverables will be graded based on online color-coded schedule sheet: green=1 (fully completed task), yellow = 0.5 (partial completed task), red = 0 (not completed task).

b) Midterm/Final Deliverables will be graded based on how well midterm/final milestone specifications are achieved. And it could be affected by following factors.
   -- Green-colored task difficulty and completion quality
   -- Code quality
   -- Perceived effort

c) Overall, your final letter grade will be determined by total points for all your deliverables and final presentation. Strictly: 90%+ = A, 80%+=B, 70%+=C, 60%+=D, and lesser numbers are an F.
Course Outline

Week 1 (Jan 7th) - Class Introduction/Overview -
- Class overview
- Maya software
  - Rules for using lab
  - Place to download Maya if using personal laptop
    - Follow-up E-mail from TA
- Team Projects
  - Team captains
- Online resources
  - OAD (Online Asset Database)
  - Excel sheet checklist

Week 2 (Jan 14th) - Begin Maya Modeling –
- Lecture on 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

NOTE: Jan 21st is a U.S. Holiday (Martin Luther King Jr’s birthday)

Week 3 (Jan 28th) - Finish Maya Modeling –
- 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 (Feb 4th) – Begin UV texturing the Phantasm Ball –
- Discussion of 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 (Feb 11th) – 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
NOTE: Feb 18th is a U.S. Holiday (President’s Day)

Week 6 (Feb 25th) – Shoebox Garage –

- Discussion of using blueprints to model 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 (Mar 4th) – 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

NOTE: The week of Mar 11th is Spring Break

Week 8 (Mar 18th) – Midterm Assignment –

- Teams chosen from class
  - Team Captains
  - Team Names
- Review of checklist usage for class
- Team Project:
  - As a group decide the theme of your series
    - (Ex: Galleons, Mollusks, Bears)
    - Each team member has to contribute to a large team tableau (Ex: A Galleon with cannons, rigging, sails)
    - Each team member makes a separate model with a separate texture
    - Only the team tableau model is turned in
- Team decides what to model from Natural History Museum
Review of necessary items to go to NHM
o Field trip for teams to go to NHM, find/research items for modeling

- Assignments Due: individual item models from team members
  o Not to be turned in, but prepped for texturing

**Week 9 (Mar 25th) – Midterm –**
- In-class lab time to finish modeling and texturing individual models for team tableau
- Assignments Due: team tableau
- Review of what each person on team contributes
  o One object, one texture
  o How/where/when to hand it in
- Follow-up Email from TA

**Week 10 (Apr 1st) – 3d Props and lighting –**
- Examples of ‘baked lighting’ for models in video games
  o Real-time lighting and shadows in mobile games
  o 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)
  o Review of what to hand in
    • One object, one texture
    • How/where/when to hand it in
- Follow-up Email from TA

**Week 11 (Apr 8th) – Organic (Avatar) modeling –**
- Character Assignment
- Modeling organic versus ‘statue’ modeling
  o Modeling for deformation
- In-class assignment of fusing two cylindrical pipes smoothly at skew angle
  o Concentric blending for arms/legs of characters
- Assignments Due: individual ‘selfie’ shots for modeling and ‘Shoebox Garage’ setup
  o not to be turned in, but prepped for texturing

**Week 12 (Apr 15th) – Organic (Avatar) texturing –**
- Lecture on Maya Projection texturing
  o Projection vs. painting on UVs
  o Baking the projection into UV map
  o In-class example using sphere
- Projection or UV painting choice for avatar models
- In-class Lab time to texture avatar model
  o Review of what to hand in
    • One object, one texture
Week 13 (Apr 22nd) – Uploading models to the OAD database –

- Lecture on 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 (Apr 29th) – 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

Final Week (May 6th) – Final assignment due

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

Statement for 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 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.

Statement on Academic Integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.