Game Design I-Theory of Games and Level Design
Mon 12:00-2:50 a.m. Rm. 312

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Course Objectives:
Upon completion of the course the students will be able to:

*Define Games and Play
* Recognize and apply basic principles of game design, including the design of rules, a core game mechanic, victory and loss conditions
*Rapidly prototyping a game design idea
*Playtest and revise a game concept
*Complete a finalized game design document
*Understand the theoretical and technical requirements of game asset creation including:
-Introduction to lowpoly modeling for games
-Introduction to texturing for games
-Introduction to game engine workflow

Attendance/Homework/Grading Policy:

Attendance:
Attendance is absolutely important in this course. If you have three unauthorized absences you will fail the course. Authorized absences can only include such things as sickness or family emergency.

Homework:
Homework will be given on a weekly or biweekly basis. It will directly reflect upon what is covered in class but will encourage that the student investigating issues more deeply than dealt with in the classroom.

This is a challenging course and you will be spending at least 20 hours/week on homework.

Backups:
All project work completed over the course of each semester must be archived. SVA servers are not a reliable place to store data and may be deleted. As a result, it is recommended that students purchase a portable firewire drive or make frequent CD/DVD burns. Please note that excuses for missing homework will not be accepted.

It is the student's responsibility to keep up to date with the class, both in terms of homework assignments given and weekly
topics. In most circumstances I will not cover material more than once.

Grading:
50% grading of weekly assignments
30% final assignment
20% attendance

MANDATORY READING (GAME CHARACTER MODELING):
Game Character Development with Maya, Anthony Ward
http://www.amazon.com/Game-Character-Development-Maya-Antony/dp/073571438X
http://www.amazon.com/Game-Character-Development-Antony-Ward/dp/1598634658/ref=pd_sim_b_7

COURSE COMPONENTS
The course will have four areas of emphasis:

1. Making Games: The course will involve students in the creation of games. These games may be digital or non-digital although for the purposes of this course, most games will be digital. Game design projects involve making a game from scratch, and can be designed to take place within a single class, over a weekend, during two or three weeks, or over the course of a single semester.

2. Iterative Design Process: Iterative design is a play based design process. Emphasizing play testing and prototyping, iterative design is a method in which design decisions are made based on the experience of playing a game while it is in development. Iterative design is a cyclic process that alternates between prototyping, play testing, evaluation, and refinement.

PRODUCTION DEADLINES:
Session 2:Initial Character Ideas and Production studio introduction
Session 6: Character Model Final (Model, texture, UV, rig)
Session 7:Production Studio begins
Session 15: Production Ends-Evaluation

COURSE OUTLINE
Session 1:

THEORY:
Game character limitations
5K+2048=optimum
Size constraints and character design

A quick primer on Game Modeling
*Basic Approaches (keep it simple)-What tools work best?
Using PolyLoopSplit
Using Slice and weld

*Setting up the environment and working with reference footage

What is Articulation?
Why do segments matter?
Smoothing for high poly design

Homework:
Read:
http://www.highend3d.com/maya/tutorials/character/300.html
Area Behind the Scenes-Mashru Mishu
Area Tutorial-Street Cop Workflow, by Mashru Mishu

Do:
Arrive to class 2 with initial character ideas including the following:

***Story:** Arrive to class with a short history and background on the character you're going to design. Who is it? What place does it live in? Give some written indication to the history of the character. For instance, if your character is a dragon living in modern day times, write a little bit about how it survived This needs to be a brief typed word document.

* **Concept Art:** Arrive to class with several visual depiction of what the character will look like. This needs

to include front and side view imagery as well as production quality concept sketches which are consistent with what you believe the in-game character will look like. Think about how tall objects are, what their size is, and how these elements influence the interactivity of the game.

Please be aware that students will need to consider the following:

1. How are game characters different from film characters?
2. Where will I need to simplify in order to create a usable interactive model?
3. How am I using character design in a novel or engaging manner? In other words, does the gaming community need another soldier model with an Ak-47?

In addition, you **MUST** Arrive to Session II with complete well thought out reference drawings for your characters. In addition to the concept art (which can be shaded and showing textures) you will need to have a clean front and side view matching proper scale and perspective sized and set up correctly in Maya.

Session 2:
THEORY:
Introduction to low-poly game character modeling
The important of Normal Maps and high poly smoothed model
The ½ person approach and use proxy with Mirror

TECHNIQUE:
Torso Construction-proper workflow
Box Modeling the Hands-A general overview

Homework:
View:
Articulation Theory
Polygon Torso video
Hand modeling I+II video
Do:
Arrive to next class with a fully modeled torso for your character project including hands and fingers. It will need to have proper topology and be optimized for game purposes. Remember that optimizing a character means you remove unnecessary details but be sure not to overdo it. It's important to gage what will be the most visible part of your character and use this as a starting point.

This model will be judged on both its technical accuracy and its exactitude.

Session 3:

THEORY:
An Introduction to Edge Looping
Modeling with human anatomy in mind
Head modeling-Two different approaches

TECHNIQUE:
Method #1:
Polygon Box Modeling-The Head

Method #2:
Edge Extrude Modeling
Using Edge and Point Welding

Homework:
View:
Gnomen Creature head modeling video
Facial Modeling Quicktime

Do:
Beginning with a subdivided cube, students will model the face and head of their character project. Note that at this point it is more important to model the character technically correct for game development(with proper optimization) and it may be the case that students will need to model an initial model which then gets refined. It's acceptable to use either the edge extrude method or the poly box model method as long as the end result is complete and reflects concept art.

Arrive to next class with the **low** polygon character model complete, attached and finalized.

Session 4:

THEORY:
Character UV and texture painting
The importance of Atlas textures for characters
The Two Map method

Maps we need: Diffuse (color), Specularity, Normal

TECHNIQUE:
Which Projection Method is Best– Cylindrical or Spherical
Manipulating UV
Creating an image based texture-An example using Photoshop and UVEditor

Homework
Read:
Wired: The Race to Build A Perfect Face (http://www.wired.com/wired/archive/10.06/face.html)

View:
Gnomon Character UV video

Do:
Working with your character projects, students will correctly Uvmap their models and export UV files into Photoshop. From this point, students will begin to create photo realistic facial features, including wrinkles and blemishes as dictated by the look of the initial concept sketches.

Session 5:

Theory
Advanced UV and texture work

TECHNIQUE:
Alpha channels and Hair
Baking ambient Occlusion into skin texture into 2d Maps (or a way to fake it using standard lighting)

Homework:
Do:
Finish character model, complete with finalized UV and texture. Character texture must include two maps,

one for head and one for body, of high quality production art.

Session 6:
Theory
applying normal maps to a low poly characters
working with Norma maps on the shader level in Unity.

Homework:
Do:
Game character model needs to modeled, uved, textured and imported into Unity for Week 7.

This will be the midterm for the semester and will 15% of the semester grade.

Level Design- this homework assignment will deal with physical interaction and environmental elements which help make interesting gameplay possible. Acting as level designers, all students will deal with abstract ideas and overall concepts to produce engaging and meaningful play within the context of the game and the Unity engine.

Arrive to next class with an initial game play idea fleshed out in an initial design document complete with 4-5 concept sketches and an initial Unity level to sell the idea. Based upon this homework, we will flesh out our concepts with greater detail and arrive an a more refined final project.

Session 7:
MIDTERM-Final game character due
Level design evaluation

Homework:
Session 8-14:

Production Studio-

Exact dates and milestones will be determined as the semester progresses.

Session 15:
PRODUCTION PROJECT DUE

The final project for this semester will be to work as a team to produce a complete playable level in Unity. Students will work with a pre-selected development studio on an upcoming, unreleased game, to produce conceptual sketches, game models, and level designs. Students will choose from several production tracks and will be assigned a nine week schedule which will dictate the workflow and expectations for the project. The end result will be an Unity level which explored character animation, gameplay, and environmental assets using professional game assets.