

GAME 1030 Video Game Art

S Y L L A B U S

Course: GAME 1030

Campus: Highland Business Center (HBC)

Room #: 301.3

Prerequisites: None

Lab hours: As posted

Course Description

This course provides an overview of the primary industry software tools used in the creation of computer game graphics. Students will learn the basic commands and interfaces of industry standard graphics software applications in order to create and manipulate two-dimensional images and three-dimensional models for video game production. An emphasis on disciplines related to the art pipeline (the steps that all art assets go through before being exported to a game-engine) will be retained throughout.

Prerequisites

None

Course Rationale

This course is aimed at students seeking a **Video Games Development Certificate**. This is an introductory level class that introduces students to game development tools, techniques, and disciplines necessary to create assets for video games.

Learning Objectives

During the term of the course, students will learn how art assets are created and implemented. They will learn the concepts and fundamentals of two-dimensional images and three-dimensional objects. They will also learn what software and techniques are used with different games and the concepts of how to apply those techniques in the current video game industry. Students will complete one unique video game asset, a three-part class project, consisting of concept art, a texture-map, and the 3-D model it will be applied to.

Instructional Methodology

This course is a 42 contact hours, 14-week Lecture-Lab course (12 weeks during Summer semester) covering the basic techniques and tools for creating video games. Each class is 3 hours in duration (3.5 during Summer semester). During each class, the instructor will present new information (lecture) and supervise students in developing their knowledge of techniques and tools used in the creation of contemporary video games. Solutions to individual student problems are demonstrated for the entire group. The instructor's ability to evaluate students' progress is founded on observing their effort and productivity in class as well as the quality of their work.

Course Outline:

Class 001- Introduction: Classroom introductions and course outline. Students will be introduced to the basic principals of video game technique. Students will be given a brief history of computer imaging and how these images are currently used in the industry. Students will learn differences between 3D games, sprite-based games, personal computer games, console games and the components that comprise these games. They will also be introduced to the concept of the teamwork involved in the production of computer games, and the three basic Disciplines (Art, Programming, and Design) employed in the process, and how those who practice those various Disciplines on any given team might interact. The concept of an art “pipeline” and how it functions, from conception to importation of fully functional art into the world-building engine, is thoroughly discussed. Class will also cover topics such as modular game building and optimizing art for engine use. Q & A at the end of class.

Class 002- 2-D Software and Game Art Overview: Students will get an overview of the different 2D software used in creating video games with an emphasis on file types and which software is used to create them. Students will learn the different types of files that comprise these games in the marketplace and see, or interact with examples of each. We will begin with a brief introduction pertaining to the artistic disciplines of both concept art as well as texture-map fabrication, describing the software packages often used for each. This will be followed by an overview of Adobe Photoshop, to include a brief introduction to its key interface, the commonly used and displayed windows and tools, and a summarized explanation of the file types it uses and creates. Likewise, we will then move on to a similar overview of Corel Painter, and the various aspects of its interface, along with a basic understanding of its uses for the purpose of conceptual art and natural media emulation.

Class 003- 3D Software and Game Art Overview: Students will get an overview of the different 3D software used in creating video games (Max, Alias, Maya, Lightwave, etc.) with an emphasis on file types and which software is used to create them. Students will be introduced to an example of a published game, using Xbox and/or Playstation. Students will learn rudimentary concept ideas and principals. After a general introduction to the various 3-D programs, we will start with a specific overview of Max 7, to include a brief introduction to interface navigation, its common tools and functionality, and an understanding of the file types it can use or create. The last part of this class will be a walkthrough of the beginning of Halo on an X-Box, from the ship at the intro to the initial terrain area on the ring-world itself, with an emphasis on showing off the particulars of how the pieces of art for the game were fabricated. The art will be closely scrutinized by ignoring game-play and walking around each piece, verbally deconstructing it, while conjecturing as to how it may have been made. Modular 3-D tiles will be pointed out, tiling texture-maps, lighting effects and fakes, particle system construction, set dressing such as furniture, plants, dropped objects, etc. will be looked at in detail. Rendering errors and model/texture-map flaws will be pointed out, so student begin to develop an appreciation for the work involved in bringing such an environment to life.

Class 004 & 005- 2D Graphics and Software Usage, Adobe Photoshop: In Class004 students will have hands on experience using Adobe Photoshop to learn the basic principals of 2D content creation in context to actual 2D game art. Students will create one piece of 2D game art. We will begin with a general discussion pertaining to conceptual art, such as initial sketches in black and white, leading eventually to color and proof-of-concept paintings, with examples of each shown. We will then break out the Wacom Tablets for each student, and do an example concept sketch (in this case, a simple barrel) in Photoshop, emphasizing the need to emulate this methodology for the final Class Project. *Students will be told at the end of this class (Class 004) that they will eventually complete a 2D concept design of their own for their final class project. Their chosen sketch should be of a simple object such as one would find in a 3-D computer game (a book, a chair, a gun, an obelisk, etc). They should create their sketch in the same format as the barrel example, having this sketch ready by the beginning of Class 007).* In Class 005 we will then discuss the concepts of creating basic texture-maps, see examples of texture-maps made for use in computer games, and come to understand the basic idea behind applying textures on an object (such as planar, cubic, and cylindrical mapping), followed by another round of work on the Wacom Tablets as we create an example texture-map for the barrel we sketched in the previous class. These examples, both the sketch and the texture-map, will be saved for future reference during class. *Students will be told at the end of this class (Class 005) that they will eventually complete a 2D texture-map of their own for their final class project. They will be using the same methodologies utilized in the barrel example to eventually create their texture-maps in Class009 and Class010, though they may begin creating or looking for source images as soon as they wish.*

Class 006- 3D Graphics and Software Usage, 3D Studio Max: Students will be introduced to the basic principals of 3D content creation and software. An overview of various different 3D software packages currently available on the market, both to larger companies as well as more affordable packages available to standard consumers, will be presented, with a more detailed introduction to Discreet's 3D Studio Max. Students will learn rudimentary 3D, (specifically sub-divisional) modeling, and principals. Instructor will create a simple 3-D barrel to compliment the 2-D work done in the previous classes, showing various techniques for achieving dimensional rings and inset/beveled top and bottom, as well as expected curvature and other features using careful construction methodology while utilizing snap tools and grid coordinates. *Assigned homework to each student: find six screenshot examples on the Internet, three different shots of 2-D tile-based games, and three different shots of 3-D polygonal-based games. Reminder: students' individual Class Project sketches due at the beginning of next class.*

Class 007 & 008- 3D Modeling Principals: *At the beginning of the class (Class 007), Class Project sketches should be completed and turned in.* In Class007 students will have hands on experience using Discreet's 3D Studio Max to learn the basic principals of simple 3D content creation and file exportation in context to actual game art. The students will be involved initially in repetitive creative exercises (rebuilding the simple barrel several times along with me) to help develop skills while learning and memorizing the complexities of Max's interface). In the second part of this class, they will then demonstrate and continue to use this knowledge as, working from their 2-D sketch, they start creating the model in Max for their own individual Class Project, utilizing the

techniques demonstrated by the instructor, as the instructor walks around from student to student, assisting and directing throughout. *Reminder: students' "homework" (the six screenshots, 3 2-D based games, and 3 3-D based games) due at the beginning of next class.* In Class008, for the first part of class, we will discuss and verbally deconstruct each student's homework choices of 2-D and 3-D-based game screenshots, pointing out with 2-D the difference between side-scrolling tile-based games, and orthogonal tile-based games. We will point out the various functionally separate layers in the 2-D games (background, foreground, non-animating, animating, and interface layers), and the tricks used to create an artificial sense of depth in the 2-D environment. We will then discuss vector graphic games in the emerging 3-D environment, and how they later became polygon-based fully 3-D texture-rendering games. We'll also discuss the different types of 3-D games shown in the screenshots, and describe the different types of graphics "shaders" used for the models, the backgrounds, and the particle effects. For the second part of the class, the students will continue with their hands-on creation of their 3-D model for their Class Project, with the instructor walking desk to desk as necessary while providing help and advice. *Reminder: those who finish their 3-D models before the end of the next class may begin work on their final 2-D texture-maps for their Class Project. They should have any image resources they wish to use by Class009 or Class010.*

Class 009 & 010- 3D Modeling and Texture Work: In Class009 the students will finish modeling their individual Class Projects, and will have the chance to work on it throughout the entire class. Students will be encouraged to keep their 3-D objects optimized for "real-time" game performance, including care used during model subdivision, vertex merging, and polygon count. The instructor will be moving through the class, helping those who need it complete any last aspects of putting the final touches to their model. If anyone finishes their model early, they will move back into 2-D (Photoshop) to begin creating the texture-map they need to fully map their object. In Class010, at the very beginning, the student may take a moment to touch any last-minute modeling of their 3-D Class Project. For the entire class, however, the instructor will shift the focus away from modeling, and emphasize the texturing and mapping process, with pointers concerning visualizing the best approach to mapping the objects each student has chosen. Once you have a good idea of the way it will be mapped, you will use the remainder of the class to create the specific texture you will need in Photoshop.

Class 011 & 012- Material Creation and UVW Mapping: In Class011 we will start with a demonstration of creating a Material in Max's Material Editor. Afterwards, students will be encouraged to finish their texture-maps, and create a Material of their own for their finished 3-D object in Max (through repetitive exercises). Once this has been accomplished, the instructor will demonstrate how to map an object using the UVW Map and the UVW Unwrap modifiers (using the barrel as an example). The students will then follow the instructor as they attempt to map their own barrel in the same way (through repetitive exercises, once again). *At the end of Class011, the instructor will be moving around the room to gather up all finished texture maps for eventual final review.*

In Class012 the students will use the UVW Map and the UVW Unwrap modifiers to map their own Class Projects in Max. The instructor will walk among the students, assisting them as necessary. During the last quarter of the class I will do a recap of the key-points of the class, with an emphasis on the various phases of the art pipeline, from concept, to texture-creation, to model-building, to mapping, and finally introducing the last stages of

optimization and exportation, including the example directory structure used for Torque. I will introduce the basic principals of Game Engines, including optimization and world building ideology as a lead-in to uploading, exporting, and evaluating their Class Projects in a real game engine (Classes 13 & 14). *At the end of Class012, the instructor will be moving around the room to gather up all finished Class Projects (mapped and textured meshes) for eventual final review.*

Class 013- Game Engines Introduction: In the first part of this class, students will be instructed on how to download and install the Torque Engine, and be introduced to the basic functionality and features of the engine itself in a “hands on” fashion. They will be re-introduced to the directory structure within the engine (and how it relates to the directory structure in the demo’s folders on their desktop), shown how to maneuver in “fly”-mode through the engine environment, and given an understanding of basic object manipulation and terrain editing. The second half of the class will be spent preparing their own Class Project objects for exportation (creating “bounding box” object, insuring all exporter plugins are installed in Max, saving their textures as BMPs in the proper Torque demo directory, and finally exporting their object using all the proper parameters in the DTS Exporter utility from Max). Once everyone has their objects imported, further changes may be required (such as resizing), resulting in repeat exportations. They will then be shown once again how to enter into the Engine, and maneuver around the environment to scrutinize their creation.

Class 14- Conclusion: This final class will be used to recap any issues and questions left unanswered, have the students fill in all the required paperwork and class documents, and finally give them a chance to personally play around with the various features of the Torque engine that would be commonly used to manipulate content and sculpt terrain.

Supplies

During the semester, you will be required to have a pencil or pen, and a 3-ring notebook with paper and pockets (in which to keep notes, exercises, projects and information sheets). You will also need one Iomega Zip disk (formatted for PC) to provide a temporary backup of your coursework or similar data storage device.

Recommended Texts:

The Art of 3-D Computer Animation and Imaging by Isaac Victor Kerlow

The Animator’s Survival Kit by Richard Williams

Timing for Animation by Harold Whitaker & John Halas

Acting for Animators by Ed Hooks

(Digital) Lighting and Rendering by Jeremy Birn

3D Game Art f/x & Design by Luke Ahearn

3D Game Programming All in One by Kenneth C. Finney

Helpful Websites

Software:

<http://www.discreet.com>

<http://www.adobe.com>

<http://www.newtek.com>

<http://www.flay.com>

<http://www.3dcafe.com>
<http://www.alias.com>

Industry News:

<http://www.awn.com>
<http://www.gamasutra.com>
<http://www.cgtalk.com>

Online Broadcasting:

<http://www.atomfilms.com>
<http://www.ifilms.com>
<http://www.hotwired.com>
<http://www.wildbrain.com>
<http://www.cartoonnetwork.com>

Organizations:

<http://www.igda.org>
<http://www.austingamedevelopers.org>
<http://www.conceptart.org>

Attendance and Class Participation

Attendance is mandatory. The level of a student's day-to-day class participation is evaluated and will be reflected in their final grade. Consistently late arrivals can add up. If you know you will need to arrive consistently late or leave consistently early, or if you know you will have to miss a large portion of the class, you should withdraw yourself and register again during a time when you can commit yourself to the work. An instructor may drop you after 3 unexcused absences. I will drop you after 5 absences whether excused or not, unless I decide circumstances merit otherwise.

Lab Participation

Working with 3-D software can take a great deal of time and it may be necessary for students make time to come on campus and work during the open lab hours. Though lab time is not tracked, you are responsible for meeting project deadlines.

If you find you are having trouble getting all your work done in class, the classroom is open on Fridays and Saturdays with a paid 3D Tutor to offer additional support and answer any questions you may have. There is a tutoring sign-up sheet at the front of the classroom. Lab hours are posted on the door outside the classroom.

Grades

Students will be given 4 grades during the semester based on; 10% (10 points) of your final grade for class attendance, 20% (20 points) of your final grade for homework, 30% (30 points) of your final grade for concept work, and 40% (40 points) of your final grade for the finished Class Project/game asset (which I divide into 20% for the 2-D texture-map, and 20% for the 3-D model). These points will add up to your full final grade for the class. These grades provide students with the opportunity to evaluate their standing in the class. Students can contact the instructor during the office hours listed at the beginning of this document if they need to discuss their progress, or to seek additional help.

Point total ranges:

		Grade 1 Attendance* (10%)	Grade 2 Homework (20%)	Grade 3 Concept (30%)	Grade 4 Final Asset (40%)
A	(90% and up)	9-10 pts.	17-20 pts.	25-30 pts.	33-40 pts.
B	(80% to 89.9%)	7-8 pts.	13-16 pts.	19-24 pts.	25-32 pts.
C	(70% to 79.9%)	5-6 pts.	9-12 pts.	13-18 pts.	17-24 pts.
D	(60% to 69.9%)	3-4 pts.	5-8 pts.	7-12 pts.	9-16 pts.
F	(59.9% or less)	0-2 pts.	0-4 pts.	0-6 pts.	0-8 pts.

* **Please Note: A student who misses more than 5 classes will be subject to being dropped from class.**

Student Evaluation

All student exercises (Homework, Concept, and Final Asset) are graded using four scales (Focus, Principles, Craftsmanship, & Creativity.)

Focus – ability to follow directions, make an effort to meet exercise objectives, work hard in & out of class, and complete the work on time.

Principles – ability to understand and demonstrate the use of the Game Principles and applied techniques.

Craftsmanship & Technique – *Craftsmanship* is aptitude, skill, and manual dexterity in use of media and tools – knowledge of interface & keyboard shortcuts, correct use of tools without the aid of notes, correct use of vocabulary. *Technique* is the manner and skill in which the student uses the tools to achieve the chosen effect – efficient use of geometry [no duplicate, hidden, or wasted geometry], proper use of surfaces [no Default surfaces; correct settings or textures in the appropriate surface channel], & well-organized files with properly placed pivots, labeled layers, and file type extensions.

Creativity and Inventiveness – ability to find unique solutions to assignment, elaborate on assigned theme, transfer concepts/techniques from previous exercises, work through problems/difficulties, originality of style & idea, and the ability to work independently.

Withdrawal

Students are responsible for withdrawing themselves if they are unable or decide to not to continue coming to class. If a student simply stops coming to class, a failing grade will appear on his/ her transcript. Instructors may also withdraw you if you miss too many classes. Please contact the instructor if you know you must miss a class.

On the final day to request a 100% refund you must complete a form at the Admissions Office.

Incomplete

Meeting deadlines is one of the most important aspects of production. Therefore, all work must be completed within the class deadlines. If there is a lack of work, the student will be graded on

the work that the instructor has received -- the instructor will not give incomplete grades. The skills taught in this class act as a foundation for subsequent classes. If a student knows he or she will not be able to complete the class, they should drop the class and register again during a time when they know they can complete the full course.

Scholastic Dishonesty

“Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations, and homework” (Student Handbook 2002-2003, p. 32). Students found in violation of this policy will be dropped from the class and a failing grade will appear on his/ her transcript.

Academic Freedom

Each student is strongly encouraged to participate in class. In any classroom situation that includes discussion and critical thinking, there are bound to be many different viewpoints. These differences enhance the learning experience and create an atmosphere where students and instructors alike will be encouraged to think and learn. On sensitive and volatile topics, students may sometimes disagree not only with each other but also with the instructor. It is expected that faculty and students will respect the views of others when expressed in classroom discussions.

Student Discipline

Everyone is expected and required to act in a scholarly, courteous, and appropriate manner during class. Inappropriate actions, behaviors, or remarks will not be tolerated and are grounds for removal from the class. Food and drink are never to be consumed near the computers.

OSD Statement

“Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations through the Office of Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester” (Student Handbook, 2002-2003, p. 14).

Other Helpful Websites

<http://www.austincc.edu/marketng/handbook/> (Student Handbook)

http://www.austincc.edu/resources_students/services.php (Student Services)