

GAME 231: Visualization and Computer Game Animation

George Mason University
College of Visual and Performing Arts
Computer Game Design
V1.0

Room: Art and Design Building Rm 2002
Term: Fall 2015
Section: 001
Class Hours: Wednesday 7:20-10:00 PM

Instructor: Paul Eric Piccione
Contact: ppiccion@gmu.edu
Office Hours: Fridays 10:00 AM-12:00 PM
Credits: 3

Course description

This course focuses on the concepts, techniques and practice of 3-Dimensional computer animation for games. A strong emphasis will be placed on creating efficient, game-ready assets, as students build and integrate characters into the Unity3D game engine. Students will also learn the basics of texturing, UV mapping and rigging, and will adapt the principles of traditional animation to a game setting.

Prerequisites

The prerequisites for this course are GAME 210 and 230, with a C grade or better, as well as a commitment to learning how 3-Dimensional artwork is created for the gaming medium and a willingness to spend time in the lab and outside of class completing each stage of the class projects. Students should be inquisitive and willing to share with other students techniques they discover as they progress through the assignments.

Objectives

- Become familiar with the tools and techniques used in making 3D game art.
- Demonstrate competency in modeling game-ready and optimized 3D objects.
- Have basic ability texturing models.
- Have working knowledge of importing models into Unity and game pipelines in general.
- Have basic ability to animate 3D models using transforms, curves, and Biped.
- Demonstrate the knowledge, technique, and discipline needed to move on to the advanced course, Game 398.

Assessment and Grading:

Assignments

Students will be given several assignments throughout this course. The assignments are listed at the end of this syllabus. Specifics for each will be given in Blackboard. **It is the students' responsibility to refer to Blackboard and the syllabus to see the exact date and time assignments are due.**

Midterm Project

By week 9, students are required to model a humanoid 3D character and submit the assets for this character as the mid-term project. Specifics will be given in Blackboard.

Final Project

At the end of the semester, students will integrate their character into the Unity game engine. The student must animate a core set of motions for the character. The student must also model, texture, and integrate a basic environment into which their character is placed. All of these elements are submitted as the final project. During the scheduled Final Exam date the class will implement their final characters into a Unity scene and control them. Specifics will be given in Blackboard.

Milestone Submission

A milestone submission is an assignment turned in multiple times as it progresses to completion. The final character has multiple milestone submissions. Specifics will be given in Blackboard.

Classroom Participation

Since this is taught as a lab class, significant class time will be spent working on projects with ample time to ask questions and get advice on how best to proceed. Students are expected to actively engage in class discussions, answer questions when prompted, and in general, add to the collective dialogue.

Final Exam

There is no final exam in this course. It is replaced by the Final Project.

Grade Weighting and Scale

All grading is done on a point scale used to assess assignments, participation in classroom activities, the mid-term project, and the final project. At the end of the course, the student's grade is a percentage of total points earned over total points possible. Students will see the point value for each assignment posted in Blackboard.

Coursework	Point Value
Assignments (each)	100
Midterm Project	200
Final Project	500
Milestone Submission	100
Classroom Participation	100

Grade Scale

To receive a grade of "A" a student must earn a minimum of 90% of the coursework point total.
To receive a grade of "B" a student must earn a minimum of 80% of the coursework point total.
To receive a grade of "C" a student must earn a minimum of 70% of the coursework point total.
To receive a grade of "D" a student must earn a minimum of 60% of the coursework point total.
Failure to receive a "D" grade will result in a grade of "F".

Failure to turn in a Final Project will result in a grade of 'F' for the course, regardless of the student's point total, since this project replaces the final exam.

'C' Grade Minimum

Students must have earned a 'C' grade or higher in prerequisite courses in the Game Design Major and Minor. For example, to take GAME 398, a 'C' or higher must have been earned in GAME 231.

Grading Criteria

Assignment and projects are graded based on the criteria given below:

- completeness
- ambition/effort
- specification adherence
- technical execution
- aesthetic qualities

Specific criteria are given in Blackboard for each assignment.

Late Work and Make-up Policy

Late assignments are not accepted. Meeting deadlines is one of the most important aspects of art production. Please pay careful attention to the DUE DATE & TIME for each assignment. DO NOT PROCRASTINATE.

If extenuating circumstances prevent a student from finishing an assignment, the student must contact the instructor BEFORE the assignment is due. Late work is only accepted at the instructor's discretion.

Attendance

Attendance is mandatory. Absences reduce a student's final grade using the chart below. Early departure is considered an absence. Three tardies equal one absence.

Deductions for Absences

1 to 3	No deduction
4	-1 letter grade
5	-2 letter grades
6+	Automatic grade of 'F'

Each class is a building block for the next. Students who miss class are missing important material and typically do not do well in this course. In the event that you have to miss class, you are responsible for making up the work and completing the assignments on time. If you miss a class, you still are responsible for the material covered that day, including project or homework assignments and changes in schedules. Should you miss class, you will first ask classmates what was covered before coming to the Instructor.

Additionally, students will need at least 10 hours of lab time (or the equivalent on their own computers) each week to complete coursework.

Resources

A traditional textbook is not used in this course. Instructions and lessons will be covered in class, with online video examples linked in Blackboard that will review the in-class lessons. These are meant to augment class lectures, not replace them and ARE NOT a viable alternative to attending class.

Several additional resources are recommended for in-depth information:

Recommended Texts:

Title: *Autodesk 3DS Max 2016 Complete Reference Guide*

Author: Kelly L. Murdock.

Publisher: SDC

ISBN#: 978-1585039500

Title: *Autodesk 3ds Max 2016 Essentials*

Author: Randi L. Derakhshani and Dariush Derakhshani

Publisher: Sybex

ISBN#: 978-1119059769

Title: *Character Animation with 3D Studio Max*

Author: Stephanie Reese

Publisher: Coriolis Group

ISBN#: 978-1576100547

Title: *The Illusion of Life: Disney Animation*

Authors: Frank Thomas and Ollie Johnston

Publisher: Hyperion

ISBN#: 0-7868-6070-7

Title: *The Animator's Survival Kit*

Author: Richard Williams

Publisher: Faber and Faber

ISBN#: 0-571-20228-4

Title: *Figure Drawing for All It's Worth*

Author: Andrew Loomis

Publisher: Titan Books

ISBN#: 978-0857680983

Websites References

<http://www.cgsociety.org/> : excellent forums for solving technical problems with 3D programs

<http://rhizome.org/> : for information about what's going on in the digital arts

<http://animationnation.com/>: an excellent animation community site

<http://www.11secondclub.com/>: The 11-Second Club, a monthly character animation competition

Autodesk Resources:

Interface Overviews:

http://download.autodesk.com/us/3dsmaxdesign/interface_overview/2010/3dsMaxUIOverview.htm

Tutorials from Essentials:

<http://usa.autodesk.com/adsk/servlet/item?siteID=123112&id=12754609&linkID=9241175>

3ds Max Services, Support and Training Videos:

<http://usa.autodesk.com/adsk/servlet/ps/index?siteID=123112&id=5585571&linkID=9241177>

Essential Skills Movies:

<http://download.autodesk.com/us/3dsmax/skillmoviesv9/>

Open Sessions

To aid students with their projects, Room 1018 may be open at specific times (TBD) during the semester. The instructor will be available in these open sessions to answer questions. These sessions are optional, and there will be no lecture and no new material will be covered, though it is strongly encouraged that students take advantage of these opportunities.

Required Class Material:

It is the student's responsibility to obtain consistent, stable access to 3DS MAX 2015 and other software used in the class (listed below). Students who can use the lab to complete all assignments are not required to have a computer to do the coursework.

Software Needed:

The software below is needed in this course. It is installed on all class and game lab computers. Students do not need to acquire this software IF they are able to use the lab to complete assignments.

- 3ds max 2016 (student version available at <http://students.autodesk.com>)
- Unity3D (free version available for download from www.unity3d.com)
- Photoshop. There's a 30-day free trial here: <http://www.adobe.com/downloads.html?PID=2294914>. There is also a student monthly discount at <http://www.adobe.com/creativecloud/buy/students.html>)
- Online backup, such as Dropbox. It is suggested that students use an online backup service to prevent their project files from being lost. External drives are very useful, but every semester multiple students report lost work due to damaged or misplaced thumbdrives, corrupted files, or dead hard drives. Online backup is a good way to save your data. Dropbox, Google Drive, Spideroak, and Sugarsync are example services that students should explore. Most services offer free storage that is sufficient in size for this course.

How to Be Successful in this Course

Every 3D model represents a puzzle. This class teaches students how to approach and solve these challenges. Modeling is heavy on problem-solving and process and light on rote memorization. Students who excel in this course are the ones who practice diligently.

Additionally:

- Follow all instructions in class and in any and all follow-up materials.
- Pursue additional help from the resources listed on this syllabus and also elsewhere, such as Google, Youtube, Vimeo, etc.
- Put in the time. Start early, finish early and allow time for polish.
- Attend every session of class.
- Consider taking this course later or adjusting your schedule if you are on credit hour overload or if you are taking other time-consuming classes (like studio art classes). Previous students claim spending an average of over 15 hours per week on this course.

GMU Honor Code:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

See GMU Honor Code: <http://academicintegrity.gmu.edu/honorcode/>

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If you are a student with a disability and you need academic accommodations please see me and contact the Disability Resource Center (DRC) at 703.993.2474. All academic accommodations must be arranged through that office.

Students must inform the instructor at the beginning of the semester, and the specific accommodation will be arranged through the Disability Resource Center.

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Sign up for the Mason Alert System by visiting the website <https://alert.gmu.edu>, and an emergency poster exists in each classroom explaining what to do in the event of crises; emergency procedures exists on:

<http://www.gmu.edu/service/cert>

Students must use their MasonLIVE email account to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

Course Outline and Class Schedule

Week 1	Introduction <ul style="list-style-type: none">• Syllabus: Objectives and Requirements.• 3D Game Art, Examples and Discussion	Sep 02
Week 2	Fundamentals, Part 1 <ul style="list-style-type: none">• The structure of 3D models• Intro to 3DS MAX User Interface• 3D Primitives• Transforms• Intro to keyframes• <i>ASSIGNMENT: BOUNCING BALL, due September 16</i>	Sep 09
Week 3	Working with Primitives, Part 1 <ul style="list-style-type: none">• Working with Editable Poly• The Modifier Stack• Sub-object Mode• <i>ASSIGNMENT: BUILD A SIMPLE ROBOT, due September 23</i>	Sep 16
Week 4	Working with Primitives, Part 2 <ul style="list-style-type: none">• <i>Submit Simple Robot assignment</i>• Editing a Model• Choose a character design for the Midterm Project• <i>BEGIN MODELING MIDTERM CHARACTER, due October 21</i>	Sep 23
Week 5	Character Modeling, Part 1 <ul style="list-style-type: none">• Reference Use• Box modeling a torso• Edge flow	Sep 30
Week 6	Character Modeling, Part 2 <ul style="list-style-type: none">• Legs and feet• Arms and hands	Oct 07
Week 7	Character Modeling, Part 3 <ul style="list-style-type: none">• Adding Details• Modeling for Animation• Optimization	Oct 14
Week 8	Midterm Due and Final Prep <ul style="list-style-type: none">• <i>Submit Midterm character</i>• Choose character design for Final Project• <i>Begin Final Project</i>• <i>MILESTONE 1: FINAL PROJECT CHARACTER MODEL, due November 4</i>	Oct 21

Week 9	Midterm Review and UV Mapping, Part 1	Oct 28
	<ul style="list-style-type: none"> • Review Midterm characters • Creating Materials • UV Mapping Basic Objects • <i>MILESTONE 2: FINAL PROJECT CHARACTER UV MAPPING, due November 11</i> 	
Week 10	Materials and UV Mapping, Part 2	Nov 04
	<ul style="list-style-type: none"> • <i>Submit Milestone 1</i> • UV unwrapping • Stitching • Pelt and Peel 	
Week 11	Rigging & Skinning	Nov 11
	<ul style="list-style-type: none"> • <i>Submit Milestone 2</i> • Photoshop Basics • Intro to Biped • Skinning • <i>MILESTONE 3: FINAL PROJECT CHARACTER RIGGED & SKINNED, due November 18</i> 	
Week 12	Animation & BIPED Fundamentals	Nov 18
	<ul style="list-style-type: none"> • <i>Submit Milestone 3</i> • 12 Principles of Animation • Biped fundamentals • Working with poses • Animating a walk/jump cycle 	
Week 13	Thanksgiving, no class	Nov 25
Week 14	Animation & BIPED Fundamentals	Dec 02
Week 15	Character Troubleshooting	Dec 09
	<ul style="list-style-type: none"> • Solving common (and uncommon) problems during production • Working in lab on Final Character 	

FINAL PROJECT DEADLINE: **Dec 16, 6:30 pm**

FINAL EXAM DATE: **Dec 16, 7:30 pm**

- Bring your completed Final Project to class
- Intro to Unity 3D
- Integrating props into Unity
- Game Engine Integration
- Character Animation Integration

The Syllabus and Assignment Schedule may be revised, based on the instructor's discretion, to meet the needs of the class.