

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

GAME 231: Computer Animation and Modeling for Games

Term: Fall Semester 2017

Section: 004

Prerequisites: Game 210 & GAME 230 with a 'C' grade or better.

Instructor: Professor Gregory Grimsby

Office: Art and Design Building Rm 2021

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3 Credit Hours

Studio/Lecture: F 10:30AM – 1:10PM

Room: Art and Design Building Rm 2002

Contact: 703-993-5733

Office Hours: TH 2:00PM to 4:15 PM
or by appointment

Website: <http://gregorygrimsby.com>

Course description:

This lecture course introduces 3D modeling and animation for games. A strong emphasis is placed on creating efficient, game-ready assets, as students build and integrate models into the Unity3D game engine. Texturing basics, UVing, rigging, and the principles of animation are also studied.

Objectives

1. Describe the tools and pipeline process used in making 3D game art.
2. Demonstrate competency in modeling game-ready and optimized 3D objects using 3DS MAX.
3. Demonstrate basic texturing ability in Adobe Photoshop.
4. Demonstrate ability to integrate models into a game engine (Unity3D).
5. Demonstrate basic ability to animate 3D models in 3DS MAX using transforms and Biped.
6. Demonstrate the knowledge, technique, and discipline needed to advance to 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

For midterm, 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

Before the final exam time in week 16, students will turn in their final project. For this project, 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. Additionally, the student will record a FRAPS gameplay video of their animated character and scene in Unity. All of these assets are submitted as the final project. Specifics will be given in Blackboard.

Checkpoint Submission

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

Classroom Participation

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. The final project replaces it.

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.

<u>Coursework</u>	<u>Point Value</u>
Assignments (each)	100
Midterm Project	100
Final Project	200
Classroom Participation	50

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".

**Plus and Minus grades are used for A, B, and C's to provide more assessment granularity.

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

!!Note that after points are totaled, the instructor may adjust a student's final grade to better reflect their accomplishments.

'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

The first late assignment is given half credit. No late work will be accepted beyond the first. 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 not accepted by Blackboard. It will need to be send via email if under 16MB in size or turned in the next class via thumbdrive if too large for email.

Attendance

Attendance is mandatory. Unexcused absences reduce a student's final grade using the chart below. Two tardies equal one absence. Email the instructor if you know you will be missing class.

Deductions for Absences

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

Each class is a building block for the next. Absent students miss important material and typically do not do well in this course. The video tutorials do not replace the lectures but supplement them. If you have to miss class, you are responsible for making up the work and completing the assignments on time.

Resources

A traditional textbook is not used in this course. Instead, students will use online resources at <http://gregorygrimsby.com> as their study material. The website contains dozens of video tutorials offered in a progression of chapters that correspond to the lecture. These are meant to augment class lectures, not replace them and ARE NOT a viable alternative to attending class.

The website is password protected. When prompted, enter this password: mason

Game Lab

In the Art and Design building, room **2002** (subject to change) is a monitored computer lab available outside of class hours for students to work on their projects. Hours are posted on the door and on the program website:

Students will need at least 8 hours outside of class each week to complete coursework.

Required Class Material:

It is the student's responsibility to obtain consistent, stable access to 3DS MAX 2018 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 2018 (student version available at <http://students.autodesk.com>)
- Unity3D (free version available for download from www.unity3d.com)
- Zip or Rar archive program
- FRAPS (free version available)
- Handbrake (free version available)
- Photoshop (no free version available). Adobe creative cloud for students is \$10/mo.
- Online backup, aka Dropbox or Google Drive.

It is suggested that students use an online backup service to prevent their project files from being lost. Every semester multiple students report lost work due to damaged or misplaced thumbdrives, corrupted files, or dead drives. 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, consider the following:

- View and attempt all the video tutorials on the website. Don't just do the graded assignments.
- Pursue additional help on the internet, aka Google, Youtube, Autodesk, etc.
- Put in the time. You cannot cram your way through this course.
- Attend every session of class.
- Do not procrastinate on your projects.
- 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).

GMU Honor Code:

GMU is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

The integrity of the University community is affected by the individual choices made by each of us. GMU has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using MLA or APA format. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

Disability Accommodations

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474, <http://ods.gmu.edu>. All academic accommodations must be arranged through the ODS.

Diversity

As a Mason faculty member, you are asked to keep diversity, one of the university's core values, in mind throughout the semester and are encouraged to include [Mason's Diversity Statement](#) on your syllabus.

Privacy

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	Sept 1st
	Syllabus: Objectives and Requirements. 3D Game Art, Examples and Discussion The structure of 3D models Intro to 3DS MAX User Interface 3D Viewports 3D Primitives Transforms Editable Poly	
Week 2	Basic Polygon Editing	Sept 8th
	Editable Poly Modifier Stack Subobject Mode Symmetry Attaching & Detaching Cutting methods Assignment Due: Lego model	
Week 3	2D Shapes and Compound Objects	Sept 15th
	Lathe Sweep Line Tool ProBoolean Controlling polygon count Material Basics	
Week 4	Polygon Modeling (continued)	Sept 22nd
	Good modeling practices Optimizing models Putting it all together. Assignment Due: Robot Model 1	
Week 5	UVing and Texturing Basics	Sept 29th
	Creating materials UVing basic objects	
Week 6	Texturing Continued	Oct 6th
	Photoshop 101 Photoshop to MAX pipeline Using the stylus to paint Photoshop texturing UVing characters with peel Midterm Due: Soup Robot Model	
Week 7	Organic Modeling	Oct 13th
	Character modeling	
Week 8	Character Modeling-clothing	Oct 20th
	Clothing & Details Assignment Due: Soup Robot Uved and textured	
Week 9	Unity3D	Oct 27th
	Intro to Unity <u>3D</u> Integrating props into Unity Game Engine Integration	

Week 10	Skinning & Rigging	Nov 3rd
	<ul style="list-style-type: none"> Rigging a BIPED character Skinning Biped Character Animation integration Checkpoint Due: Final Project Character Model 	
Week 11	Animation & BIPED Fundamentals	Nov 10th
	<ul style="list-style-type: none"> Principles of Animation Creating Keyframes Ease In –Ease Out Biped fundamentals Working with poses 	
Week 12	Animation Cycles	Nov 17th
	<ul style="list-style-type: none"> Using animation references Sliding Foot keys Animating a walk cycle Checkpoint Due: Final Project Character UVed, Rigged, Skinned, & in Unity 	
Week 13	Thanksgiving break	Nov 24th
Week 14	Unity Visuals	Dec 1st
	<ul style="list-style-type: none"> Unity Terrain Handling the sky Lighting Fog 	
Week 15	Final Project	Dec 8th
	<ul style="list-style-type: none"> Final Presentations Final Project Due: Unity Projects and FRAPS Videos 	

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