CS4455/CS6457 Video Game Design - Syllabus

Instructor

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Description

Welcome to CS6457 Video Game Design. The course covers many game design topics including game engine concepts and technologies, structural elements of games, and game design process.

CS6457 is a project-based course and includes both individual assignments as well as a group project. Learning objectives are focused primarily on creating fully three-dimensional games with real time game object control. This includes games that meet the criteria of Game Feel such as Super Mario 64.

Technical Requirements and Software

All software development is performed with the Unity Engine and the C# programming language. Students need a Windows PC or Mac capable of running Unity. At minimum, students must have use of a laptop with the capabilities required by the OMSCS program.

Suggested Background Knowledge

Students are not expected to be familiar with the Unity Engine. Outside of C# experience, familiarity with a strongly typed object-oriented programming language such as Java is helpful.

Useful prerequisite knowledge for the course includes linear algebra and computer graphics basics. Understanding of affine transformations of homogeneous coordinates, transformation order, quaternions, 3D projection, matrix stacks, scene graphs, graphics lighting models such as the Phong reflection model, are all relevant.

Assignment Weighting

Note: Assignments and weighting may change semester to semester. Please see Canvas for specifics.

Type	Assignment	Value
Quizzes	(10% Total)	
	Short quiz per learning module	Various, contributing to 10% overall
Individual Milestones	(45% Total)	
	Warmup	1%

	Character Control - Animation-Based	11%
	Environment Interaction (Physics)	11%
	UI and Prefabs	11%
	AI	11%
Team Project	(45% Total)	
	Pitch and Interaction Demo	4%
	Alpha Demo	8%
	Playtesting and Analysis	8%
	Final Game (Presentation, Video, Code Submission, etc.)	25%
		Failure to participate can result in all team project credits lost for individual

Recommended Texts

BOOK TITLE: Game Design Workshop, Fourth Edition: A Playcentric Approach to Creating Innovative Games (Paperback)
AUTHOR: Tracy Fullerton
ISBN #: ISBN-10: 978-1138098770 ISBN-13: 978-0240809748

BOOK TITLE: Game Feel: A Game Designer's Guide to Virtual Sensation - 1st Edition (Morgan Kaufmann Game Design Books) (Paperback)
AUTHOR: Steve Swink
ISBN #: ISBN-10: 0123743281 ISBN-13: 978-0123743282

Lecture Topics

Subject to change

1. Course Intro
2. Game Engines
3. Animation in Games
4. Character Control with Animation
5. Game Feel
6. Game Controllers
7. Physics simulation
8. Case Study: Trespasser
9. Formal Elements
10. Design Process Brainstorming, In-class exercise
11. Case Study: Valve's Cabal Development Process
12. Prototyping/Rapid Prototyping
13. Playtesting
14. Artificial Intelligence
15. Case Study: F.E.A.R.
16. Elements of Fun

Course Policies

Attendance

For online versions of this course, attendance (real-time communication by voice/video) is only relevant to assignments involving presentations and quizzes. There may or may not be some flexibility regarding when these assignments occur. Please refer to each individual assignment for details. Lectures are pre-recorded and therefore students can view on their own schedule.

Institutional approval is required to make up for missing an event that requires attendance. Refer to the Course Catalog for procedures for obtaining an institutional ruling on excused absences and other exceptions. You might start with the Attendance Policy: http://www.catalog.gatech.edu/rules/4/

Final Exam Period

Do not make plans that lead to you being unavailable during final exam period for this class (e.g. during Finals Week). Project presentations may take place during the final exam period and all team members must be present.

Academic Integrity

<u>Collaboration</u>
You and fellow students are welcome to discuss both individual and group project assignments with each other, but you may not share code on individual assignments. Everyone must submit their own work for assignments specified as individual efforts.

Student can discuss and demonstrate Unity tools with other students (e.g. show where an option is buried in a graphical menu). Additionally, students can discuss high level solutions to problems, or share references to useful publicly available tutorials.

Third party tools/APIs that substantially accomplish the learning objectives of an assignment require approval before use (also, you must cite the approved resource in your readme).

If you have any doubts regarding interpretation of the integrity policy, please contact the TAs or instructor(s) for clarification.

The Office of Student Integrity will be notified if an academic integrity violation is suspected.

<u>Plagiarism</u>

For individual assignments, do not copy code from current or former students of the class. It's best that you don't even look at anyone else's code or other authored deliverables.
It is OK to utilize publicly available tutorials/demos from educational sources (e.g. tutorials provided by Unity). However, you must cite the resources you use in the readme file that accompanies your assignment submissions.

Self-Plagiarism
Double-dipping with another course deliverable requires approval in advance from all instructors involved (e.g. Game AI, capstone project, etc.). An example of double-dipping would be if you used your Video Game AI milestone as your final project in the Game AI course with minor modifications and otherwise not approved by the instructors. Another example is if you reused assets you developed for the Interactive Narrative course in your final project in Video Game Design. You must obtain approval even if you aren't taking the courses in question during the same semester.

You can use your own code/assets that you developed without advanced permission if it is unrelated to your GT coursework and hasn't already been used for another class deliverable. You still need to cite it in your readme though.

Late Policy

There is a 24-hour grace period for late submission. There is no penalty for making use of the grace period.

Incompletes

Incompletes are rarely given for this course.

The institutional policy is available here:
http://www.registrar.gatech.edu/students/igrades.php (Links to an external site.)

Note the line:
"If the student is missing so much work that a passing grade could not have been assigned…"

Be aware that "work" referred to above includes all course assignments, including those not due yet.

For this class, hardships are best addressed via normal course withdrawal or as a last resort, petition to withdraw after drop day. Note that late withdrawals are very rarely granted if requesting withdrawal from an individual class as opposed to full withdrawal due to hardship. Communicate with your advisor, instructors, and Dean of Students regarding hardships as soon as problems arise.

Warning About Cross List Double-Dipping

DegreeWorks blocks "double-dipping" on cross-listed course credits! If you previously took CS4455 (undergrad section) and counted it towards a degree, you cannot count CS6457 towards another degree.
There is no slipping through the cracks, DegreeWorks *will* catch you! (but Oscar will not warn you when registering).

This policy applies to ALL cross-listed GT courses.
Want more game design? Consider a Digital Media class (on-campus) like Interactive Narrative or a special problems project or Masters project.

Team Issues and Impact on Assigned Grade

Regarding the team project, all team members are expected to participate at each step of the project. Failure to participate can result in partial or complete loss of credit towards team assignments.

Participation is measured via team member assessments submitted after specific deliverables and the end of the project.

Additionally, we ask that any team that is having trouble to notify the instructor and TAs immediately regarding the issue rather than wait until the end of the semester.