Course Title: **Game Development**

Description: Aesthetic and technical aspects of computer game development, including game mechanics, story development, content creation and game programming. Topics include game design, interface design, 3D modeling & animation, graphics algorithms, shader programming and AI. Students will work in groups to design and develop a game from start to finish.

Prerequisite(s): VIST 486 or CSCE 441 or instructor approval

Introduction: This course will give an introduction to computer game development starting from concept development to implementation of a playable game prototype. Both the aesthetic and technical aspects of game development will be covered. The aesthetic component of the course will focus on story and character development, game mechanics, game play and interface design and content creation for games. The technical component of the course will focus on programming tools and concepts for games, including data structures & algorithms, computer graphics, human-computer interaction, shader programming and AI. Common topics include project management, prototype development and play testing. Students will work in groups and go through the complete pipeline starting from a basic game idea all the way through developing a playable prototype.

Objectives: Students will learn the aesthetic and technical aspects of game development including story development, game play & mechanics, interface design, game content development, game programming, prototype development, play testing and project management. At the end of the course, students will have designed a new game, developed the story board and art assets for the game and implemented a playable prototype.

Course topics: A tentative list of course topics is given below. Topics are grouped into aesthetic and technical tracks wherever appropriate; however all students will be exposed to both tracks.

	Aesthetic track	*Technical track*
Weeks 1 to 2	Introduction, Game design review, Game development pipeline	
Weeks 3 to 5	Story development, Story boards for games	Real-time graphics, shader programming
Weeks 6 to 8	Game development tools and techniques, project management	
	Game content creation (graphics, animation & sound)	Artificial Intelligence for games, search algorithms
Weeks 9 to 10	Game play and interface design	User interfaces & peripherals
	Basic game prototype development	
Weeks 11 to 12	Game rule development, levels of difficulty	GPU Programming, multi-threading, particle systems
Weeks 13 to 14	Computer-controlled agents in games	Blending, special effects
	Play testing and rule balancing	

The specifics of what will be covered under each topic will depend on the composition of the class, game ideas that students develop and implementation choices that groups make. Other material may be presented depending on class interaction and problem contexts.

Tutorials on game development tools may be given as required. Relevant articles and research papers on the subject of game design and development may also be presented in class and/or assigned for reading.

Grading and Evaluation: The final grade for the course will consist of the following components weighted as indicated:

- Project 1 (group):   **30%**
- Project 2 (group):   **60%**
- In-class presentation (individual): **10%**

Each student will be expected to make one in-class presentation on a topic relevant to the course. The class participation grade will be based on attendance as well as participation in discussions and activities in the class.

Grading for each project will be based on the following criteria:
- Project 1 (due end of Week 4)
  - Finished game: 50%
  - Periodic progress presentations: 30% (3 presentations)
  - Website: 10%
  - Peer evaluation: 10%
- Project 2 (due end of semester)
  - Finished game: 45%
  - Meeting group-defined milestones: 15%
  - Periodic progress presentations: 15% (5 presentations)
  - Final project presentation/demo: 5%
  - Website: 10%
  - Peer evaluation: 10%

The finished game will be graded on visual quality, technical quality and the "fun factor" in the game. Points will be awarded for innovation and creativity in game design, user interface and implementation. We may also make use of external reviewers for evaluating the finished game.

For each project, each group must maintain a website to showcase the game and post updates. In addition, each group will make periodic presentations on the progress made in since the previous update.

Each group member is expected to contribute equally to the group project. However, each group will be responsible for identifying the roles of group members and specific tasks assigned to them. For Project 2, each group will also identify project milestones and a corresponding timetable on which the group will be graded. In addition to the instructors' evaluation, a peer review and report from each student will be used to evaluate individual performance within a group.

The final submission for each project should include a record of the story development process, the story board, assets used by the game and the playable prototype, including the source.

Attendance: The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/.

Required None

Texts:

Optional Texts:
- *The Art of Game Design: A book of lenses* by Jesse Schell; Morgan Kaufmann, 2008. ISBN 0123694965
- *Rules of Play: Game Design Fundamentals* by Katie Salen and Eric Zimmerman; MIT Press, 2004. ISBN 0-262-24045-9
- *Chris Crawford on Game Design* by Chris Crawford; New Riders Press, 2003. ISBN 0-13-146099-4
- *The Game Maker's Apprentice: Game Development for Beginners* by Jacob Habgood and Mark Overmars; Springer-Verlag, 2006. ISBN 1-59059-615-3
- *3D Game Environments* by Luke Ahearn; Focal Press, 2008. ISBN 978-0-240 80895-6
- *Game design course: principles, practice and techniques* by Jim Thompson, Barnaby Berbank-Green and Nic Cusworth; John Wiley & Sons, 2007. ISBN 0-471-96984-3
- *Game Design Workshop: A Playcentric Approach to Creating Innovative Games* by Tracy Fullerton; Morgan Kaufmann, 2008. ISBN 0240809742

Supplemental Readings:
As assigned in class.

Costs:
Cost of materials and software that may be required for each project.

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SPECIAL NOTES

American with Disabilities Act:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room B118 of Cain Hall or call 845-1637.

Copyright:
The handouts used in this course are copyrighted. By "handouts," we mean all materials generated for this class, which include but are not limited to syllabi, quizzes, lab problems, in-class materials, review sheets and additional problem sets and the contents of the class Web site. Because these materials are copyrighted, you do not have the right to copy the handouts, unless you are expressly granted permission. You have permission to make printouts of the on-line class notes and the class web site strictly for your use in this class.

Each student retains joint, non-exclusive, copyrights to any work that he or she creates as part of this class.

Plagiarism:
In this course, collaboration and the free interchange of ideas among students is encouraged; in particular the discussion of reading and writing assignments and review questions, approaches to solving them, etc. However, we do not allow plagiarism, which, as commonly defined, consists of passing off as one's own the ideas, words, writings, etc. that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission

of that person. Plagiarism is one form of scholastic dishonesty. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section on Scholastic Dishonesty.

Aggie Honor Code:

"An Aggie does not lie, cheat or steal or tolerate those who do"

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: www.tamu.edu/aggiehonor/.