Sul Ross State University

A Member of the Texas State University System

CSAT2315– Introduction to Game Programming – spring, 2015

Instructor: Dr. Kennard Laviers

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Office hours: MWF (9:00am-11:00am & 1PM-3:00pm)

Course Objectives

This course will introduce computer science students to the theory and practice of developing modern 2 and 3D games using the Unity game engine. Practical concerns will be balanced by discussion of relevant theory from the literature of computer science (graphics, software engineering, and multimedia), cognitive psychology, game-related mathematics, motion-based physics, Finite State Machines and sprite/atlas management. Students will understand the full life cycle of developing a game for one of the mobile platforms like the Apple App Store or Google Play Store. Students will learn the basics of the C# programming language. Students will also participate in individual and group projects to design, implement, and evaluate entry-level games. Students who take this class will: (a) Develop basic user interface design skills, such as menus, inventory systems …

(b) Develop an understanding and be able to implement basic examples of lighting, physics, 3D Modeling, animation, character controllers, rigging and skinning, camera/atmospheric effects, particle systems, and 3D world terrains.

(c) Understand the use of vector math to animate objects in 2 and 3 dimensions

(e) Understand Finite State Machines and be able to implement them for animations and simple AI systems, and UI game flow

Textbook:

None required. This course will make extensive use of the Unity manual and online resources

Teaching Methods

Assignments: Exercises will be periodically assigned to help support and supplement material found on the Unity Learning website. No make ups are allowed, unless medical or extreme conditions are considered. Tests, assignments and final exam will be delivered through Blackboard with a date and time limit. No make ups are allowed, unless medical or extreme conditions are considered.

Grading

Letter grades will be determined using a standard percentage point evaluation as outlined below.

A 90 - 100 points

B 80 - 89 points

C 70 – 79 points D 60 – 69 points

F Below 60 points The final grade will be computed on the following weights:

Tests:

Exam ==> 15%

Project 1 ==> 15%

Project 2 ==> 15%

Project 3 ==> 15%

Final ==> 20%

Assignments (individual/group) ==>15%

Participation ==> 5%

Course Policies

Exams, quizzes and assignments: NO MAKE-UPS ARE ALLOWED, unless medical or extreme conditions are present.

Academic dishonesty

You are expected to do your own work on all assignments, exams, quizzes, and projects. Any dishonest work will be penalized with a grade of zero.

Need for assistance

Qualified students with disabilities needing academic or other accommodations to ensure full participation in the programs, services and activities at Sul Ross State University should contact the Disabilities Services Coordinator, in Counseling and Prevention Services, Ferguson Hall 112, Box C-117,Alpine, Texas 79832.

Posting of Grades

As soon as assignments, tests and final exam are graded, the grades will be posted in Blackboard.

Tentative Content Schedule

Week	Material	Test/Assignments
Week 1	**C# An Overview** -- Variables -- Conditional Statements -- Loops -- Vectors -- Property Values -- Objects/Classes -- Extension Methods	Download and install Unity Watch Unity Editor Lessons; http://unity3d.com/learn/tutorials/modules/beginner/scripting
Week 2	**The Unity Game Engine:** -- An Overview -- Unity GUI -- 3D vs 2D -- Lights, Camera Action! -- Shadows -- Input mapping -- PlayerPrefs -- Resource Directory -- Terains	Watch Unity Script Videos http://unity3d.com/learn/tutorials/modules/beginner/editor and http://unity3d.com/learn/tutorials/modules/beginner/graphics
Week 3	**Types of Games – Things to consider** -- Racing -- First Person Shooters -- Role Playing Games -- Puzzle Games -- Card Games -- Multi-Player Games …	Complete tutorial: http://unity3d.com/learn/tutorials/projects/roll-a-ball
Week 4	**Finite State Machines (FSM)** -- Nodes/Edges -- States/Actions -- Graphs -- Conditions -- Events -- State-Based Controllers -- Animation -- Machanim	Complete tutorial: http://unity3d.com/learn/tutorials/projects/survival-shooter

Week 5	**Artificial Intelligence**
	-- Search
	  -- Min-Max
	  -- Monte Carlo
	-- Fitness Functions
	-- Behavior Trees
		http://unity3d.com/learn/tutorials/projects/space-shooter

	-- Path-planning	
Week 6	**Let's Make a Game <Design>** -- Game Design -- Modeling -- Texturing (Sprites/Atlas) -- Sound -- The Graphic User Interface	Watch Unity Lessons: http://unity3d.com/learn/tutorials/modules/beginner/ui

Week 7	**Let's Make a Game <State-Controller>**
	-- Designing the FSM
	  -- Game Flow
	  -- Menu
	  -- Pause
	  -- TIMERS!
	-- Implementing the state controller
	Test 1 in class: Covers in-class discussion and tutorials.
		Project 1
		User Interface

Week 8	**Let's Make a Game <Filling in the Controller>** --Back to C# --Static Classes --Helper Functions --Property functions again --Some great free Assets! --LeanTwean to move-it --Rotate --Translate --Lerping --Vector's Again	
Week 9	**Let's Make a Game <Level Design>** --XML or using a FSM to store level data --Making the game fun	Watch Lessons: http://unity3d.com/learn/tutorials/modules/beginner/navigation
Week 10	**Let's Make a Game <Player Controller>** --First Person --Third Person --Dragging --Joystick controls	Project 2 Playable game with testing level

Week 11	**Let's Make a Game <Finishing Touches>** --Help page --Manual --Credits --Polishing up the interface --Testing-testing-testing	
Week 12	**Let's Make a Game <Publishing the Game>** --Places to publish --Screenshots --Game Video --Game Write-up --Keywords --Categories --- things to think about to sell some games --Reviews	Project 3 The complete game
Week 13	Review for Final	
Week 14	Final	