

SG220 3D Game Engine Architecture

Instructor	Course Dates
<i>Tom Sinclair</i>	<i>05/28/2008 - 07/31/2008</i>

Classroom Hours	Office Hours
<i>Independent Study</i>	<i>Wed Noon - 4 PM</i>

Course Description

This course introduces students to game engine architecture, APIs, and graphic functions. Topics include scene hierarchy, texture management and formats, graphic tools, and how they work together. Students will investigate approaches to developing code for different engines using procedural, object-oriented, or patterned architectures. Upon completion of this course students should understand the process of building a 3D graphics engine.

Course Outcomes

Upon completion of this course, students should be able to:

Knowledge

- Examine game engine architecture, APIs, and graphic functions.
- Explain how scene hierarchy, texture management, and graphic tools work together within game engine architecture.

Skills

- Customize a game engine by making level changes utilizing both script and code.

Attitudes

- Value the various elements which are involved in the process of modifying a 3D game engine.
- Assess the history, evolution and future trends of 3D game engines.
- Appreciate the architecture of a game engine.

Course Prerequisites

SG110, SG210

Class Breakdown

Lecture Hours:	72
Lab Hours:	36
Total Hours:	108

Credit Hours

CO/IL/GA = 9.0 Credit Hours
 CA/VA = 8.5 Credit Hours

Course Texts

Suggested text: "Programming a Multiplayer FPS in DirectX", by Vaughan Young
 "3D Game Programming All-In-One", by Kenneth C. Finney

Teaching Strategies

The teaching strategies for this course include facilitated discussion (with visuals as needed), demonstration, class discussion, hands-on guided practice, and feedback.

Grading

Key Graded Assignment: 3D Game Engine Analysis Research Paper*	30%
Key Graded Assignment: Customization Lab	45%
In-Class and Out-of-Class Activities	25%

* Indicates that this Key Graded Assignment has a research component.

It is recommended that students keep all Key Graded Assignments to use in their portfolio.

At the end of each course, each student is assigned a final grade as follows:

Grade	Quality Points	Point Range	Interpretation
A	4.0	93-100	Excellent
A-	3.7	90-92	
B+	3.3	87-89	
B	3.0	83-86	Above average
B-	2.7	80-82	
C+	2.3	77-79	
C	2.0	73-76	Average
C-	1.7	70-72	
D+	1.3	66-69	
D	1.0	60-65	Below average
F	0.0	59 & below	Failure
I	0.0		Incomplete

Course Completion Requirements

Students must achieve a passing grade of D or above by completing all required examinations, submitting all required lab exercises and projects, and meeting the standards of the school attendance policy.

Attendance and Classroom Policies

Students are expected to adhere to the attendance and tardiness policies stated in the current catalog.

Food and Drinks: NO food or drinks allowed near the computers.

Music: NO music with explicit lyrics will be played out loud in class regardless of the class opinion. NO exemptions will be made. Headphones will be allowed in class during lab time but must be removed during lectures.

Cell Phones: Cell Phones are not to be used during class time. Be sure your cell phone is set on SILENT or OFF. It is your responsibility to ensure that your phone does not disrupt the class.

Westwood Students Only: The Denver South Campus classrooms and labs are for the use of Westwood students ONLY. Please do not invite friends or family who are not students here to use the classroom or lab facilities. Anyone who would like to visit the campus must sign in at the Front Desk.

Lab Supervision: If the lab is locked or currently unsupervised, please go to the Front Desk to sign-in and leave your student ID. If there is no one available to supervise the lab, it may not be possible for you to use the lab until there is a lab supervisor.

Internet Use: The Internet connection is provided for work related to your classes at Westwood College. It is not for personal use. Viewing inappropriate sites in a Westwood College classroom or lab is forbidden and could result in sanctions, up to and including expulsion.

Drug Free Schools Act: Westwood forbids the use, possession, distribution, or sale of drugs or alcohol by students, faculty, or staff anywhere on the College's property or at College sponsored events off campus. Anyone in violation of state, federal or local regulations with respect to illegal drugs or alcohol may be subject to both criminal prosecution and campus disciplinary action. Students who are suspected of being under the influence of drugs or alcohol on campus will be sent home in a taxi and face an automatic suspension.

Plagiarism Policy: Students must ensure that all work submitted is original work with appropriate citations. Plagiarism (copying other's work or failing to credit other's ideas within a body of work through appropriate citation) is not tolerated at Westwood College.

First Recorded Offense:

Mandatory

The student receives zero credit for the entire paper, exam, quiz, homework, lab, etc., in which the incident of academic dishonesty occurred. No partial credit may be given. Were the incident involves a graded assignment normally subject to a "drop" option, the student may not exercise that option.

Second Recorded Offense:

Mandatory

The student receives a failing grade for the class, lab, etc., in which the second offense occurs. The second offense need not be in the same class, program, or term as the first offense to invoke this action.

Discretionary

- The student receives suspension for up to one academic year; or
- Permanent expulsion.

Third Recorded Offense:**Mandatory**

The student is permanently expelled from Westwood. The third offense need not be in the same class, program, or term as the first offense to invoke this action.

Appeals:

All offenses and/or sanctions may be appealed. The student must contact the Director of Education to initiate the appeal and to identify the specific steps in the appeals process.

Attendance Policy: Students are expected to adhere to the attendance and tardiness policies stated in the current catalog.

After a student misses **10% or 10.8 hours of class (3 class sessions)** due to **absences, tardiness, or leaving class early**, the instructor will create a Student Action Report (SAR) placing the student on attendance probation.

Once the student has missed **20% or 21.6 hours of class**, a SAR will be written to either **withdraw** the student from the course or allow the student to make up the time and/or work. Students will only be allowed to make up time with a documented excuse. Make up work will consist of a project that involves research and will have a specific due date (usually the next class session). If the work is not made up to the satisfaction of the instructor and /or the due date is missed the student will be withdrawn from the course. If a student is withdrawn from the class with a last date of attendance after 80% of the class dates have passed (approximately within the last 2 class sessions), the student will receive a failing, or "F" grade, for the class.

Other than students who are approved for make-up time or work by their instructor, the only students who may be allowed to stay in class with more than 20% absences are students who are granted an Excused Absence. Excused absences must be documented and approved by the **Director of Education, Daniel Snyder**, prior to the absence if possible. Reasons for granting an excused absence may include: serious student medical problems, pregnancy, military or law enforcement duty, jury duty, or the death of an immediate family member. If a student does not return to class on or before the approved return date, the student may be withdrawn from the class.

Due Dates: Assignments are due on the date specified by the instructor. Any assignments turned in after that date will receive a grade of 0 (zero). If you are not finished by the date due, hand in what you have to receive partial credit.

Course Topics

- Course Introduction

- Introduction to 3D Game Development
- Library Research for Game Engine Research Paper
- Game Engine Design
- Framework
- Engine Control
- Scripting
- 3D Programming Concepts
- Rendering
- Sound
- Networking
- Materials and Meshes
- Rendering Special Effects
- Objects
- Scene Management
- Foundations
- Players
- Weapons

**** = library research**