### COURSE OUTLINE OF RECORD

**Number:** CS G147  
**TITLE:** Game Programming, Introduction

**ORIGINATOR:** Omid Pourzanjani  
**EFF TERM:** Fall 2008

**DATE OF OUTLINE/REVIEW:** 11-16-2006

**CROSS LISTED COURSE:**

**TOP NO:** 0614.20

**CID:**

**SEMESTER UNITS:** 4.0

**HRS LEC:** 54.0  
**HRS LAB:** 54.0  
**HRS OTHER:** 0.0

**CONTACT HRS TOTAL:** 108.0

**STUDY NON-CONTACT HRS RECOMMENDED:** 108.0

**CATALOG DESCRIPTION:**

This course is designed to study the principles of computer game development. Students will be introduced to the basic building blocks of computer games and learn about the various game engines. Concepts of graphics objects, rendering, shading, transformation, alpha blending, stenciling, texture, and materials will be discussed and practiced. ADVISORY: Computer Science G177 or G178

**JUSTIFICATION FOR COURSE:**

**PREREQUISITES:**

**COREQUISITES:**

**ADVISORIES:**
- CS G177 RETIRED FALL 19: Visual Basic.NET
- CS G178: Visual C# .Net

**ASSIGNED DISCIPLINES:**
- Computer science

**MATERIAL FEE:** Yes [ ] No [X] Amount: $0.00

**CREDIT STATUS:** Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

**GRADING POLICY:** Pass/No Pass [X] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

**OPEN ENTRY/OPEN EXIT:** Yes [ ] No [X]

**TRANSFER STATUS:** CSU Transferable[X] UC/CSU Transferable[ ] Not Transferable[ ]

**BASIC SKILLS STATUS:** Yes [ ] No [X]  
**LEVELS BELOW TRANSFER:** Not Applicable

**CALIFORNIA CLASSIFICATION CODES:** Y - Not Applicable

**NON CREDIT COURSE CATEGORY:** Y - Not applicable, Credit Course

**OCCUPATIONAL (SAM) CODE:** C

**REPEATABLE ACCORDING TO STATE GUIDELINES:** No [X] Yes [ ] NUMBER REPEATS:

**REQUIRED FOR DEGREE OR CERTIFICATE:** No [ ] Yes [X]

**Associate of Arts: Liberal Arts: Emphasis in Business and Technology(Associate in Arts)**

**Video Game Development(Associate in Arts)**

**Video Production(Certificate of Specialization)**

**GE AND TRANSFER REQUIREMENTS MET:**

**COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:**
1. compare and contrast the functionality in the existing gaming engines.
2. demonstrate knowledge of current and popular gaming engines for the Windows platform.
3. distinguish and apply the theory and principle of the mathematical algorithms utilized in 3D games.
4. apply theoretical knowledge with hands-on lab assignments for drawing primitive objects and applying lighting, textures blending, stenciling, shadowing, and transparency techniques.
5. understand and describe the world of 3D interactive game programming.
6. integrate sound and video into the fabric of a computer game design games that interact with user I/O devices such as joysticks.
7. use the internet and library resources to research topics and communicate via e-mail.

COURSE OBJECTIVES:
1. Understand and describe the world of 3D interactive game programming.
2. Compare and contrast the functionality in the existing gaming engines.
3. Demonstrate knowledge of current and popular gaming engines for the Windows platform.
4. Distinguish and apply the theory and principle of the mathematical algorithms utilized in 3D games.
5. Apply theoretical knowledge with hands-on lab assignments for drawing primitive objects and applying lighting, textures blending, stenciling, shadowing, and transparency techniques.
6. Integrate sound and video into the fabric of a computer game.
7. Design games that interact with user I/O devices such as joysticks.

COURSE CONTENT:

LECTURE CONTENT:

The following outline describes the course contents:

Visual Studio .Net and C#

3D Mathematics and Concepts
- Vectors
- Matrices
- Planes
- Rays
- Transformation

Direct3D Fundamentals
- Initialization
- Rendering Pipeline
- Drawing in Direct3D
- Color
- Lighting
- Texturing
- Blending
- Stenciling

Applied Direct3D
- Fonts
- Meshes
- Cameras
- Terrain Rendering
- Particle Systems
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Picking
Shaders and Effects
   Shading Language
   Vertex Shaders
   Pixel Shaders
Sound Effects
Input Devices

LABORATORY CONTENT:
The following outline describes the course contents:

Visual Studio .Net and C#
3D Mathematics and Concepts
   Vectors
   Matrices
   Planes
   Rays
   Transformation

Direct3D Fundamentals
   Initialization
   Rendering Pipeline
   Drawing in Direct3D
   Color
   Lighting
   Texturing
   Blending
   Stenciling

Applied Direct3D
   Fonts
   Meshes
   Cameras
   Terrain Rendering
   Particle Systems
   Picking

Shaders and Effects
   Shading Language
   Vertex Shaders
   Pixel Shaders

Sound Effects
Input Devices

METHODS OF INSTRUCTION:
   A. Lecture:
   B. Lab:
   C. Independent Study:

INSTRUCTIONAL TECHNIQUES:
COURSE ASSIGNMENTS:

Reading Assignments

A. Required Readings such as:
Students will be assigned multiple chapters from the required textbook.
The availability of additional materials will be made known to students to encourage further study into specific topics.
Students will be assigned to read a large amount of online material.
Various current (up-to-date) handouts will be made available to students on the subjects of 3D games, game engines, and multimedia.

Out-of-class Assignments

D. Other Assignments:
An optional library research paper will promote further study and research in 3D interactive game development or other related topics selected by the student and approved by the instructor.

Writing Assignments

B. Required Writing, Problem Solving, Skills Demonstration and/or proficiency:
Students will be required to complete the following assignments during the lab section of the course:
1 3D games engine research paper
4 Programming assignments
1 individual or group term-project

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Essay Examinations
Objective Examinations
Report
Projects (ind/group)
Problem Solving Exercises
Oral Presentations
Skills Demonstration

Demonstration of Critical Thinking:

C. Demonstration of critical thinking/problem solving:
Class assignments will be presented to the students in the form of problems requiring students to devise solutions in the form of software development projects.
Also, students will be given various games engine technology architectures to study and analyze.

Required Writing, Problem Solving, Skills Demonstration:

B. Required Writing, Problem Solving, Skills Demonstration and/or proficiency:
Students will be required to complete the following assignments during the lab section of the course:
1 3D games engine research paper
4 Programming assignments
1 individual or group term-project

TEXTS, READINGS, AND RESOURCES:

TextBooks:

Other:
1. A syllabus and multiple reference materials will be distributed by the instructor.
LIBRARY:
  Adequate library resources include:
  Comments:

Attachments:
  Attached Files