CS 74.42B Course Outline as of Spring 2011

CATALOG INFORMATION

Dept and Nbr: CS 74.42B Title: GAME DEVELOPMENT 2
Full Title: Game Development with C#/XNA 2
Last Reviewed: 3/31/2014

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	4	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
A survey of fundamental game development techniques. The basics of artificial intelligence, animation, real-time rendering, and collision detection/response are covered through the development of a game engine written in Microsoft XNA (Xbox Next-generation Architecture). Students in this class will collaborate to develop games using a realistic industry workflow. This course also addresses professional issues, such as creating resumes and portfolios, technical interviews, and finding engineering jobs within the games industry.

Prerequisites/Corequisites:
Course Completion of CS 42 (or CS 74.42 or CS 74.42A)

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Schedule of Classes Information:
Description: A survey of fundamental game development techniques. The basics of artificial intelligence, animation, real-time rendering, and collision detection/response are covered through the development of a game engine written in Microsoft XNA (Xbox Next-generation

Architecture). Students in this class will collaborate to develop games using a realistic industry workflow. This course also addresses professional issues, such as creating resumes and portfolios, technical interviews, and finding engineering jobs within the games industry. (Grade or P/NP)
Prerequisites/Corequisites: Course Completion of CS 42 (or CS 74.42 or CS 74.42A)
Recommended: Eligibility for ENGL 100 or ESL 100
Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**			Effective:	Inactive:
CSU GE:	**Transfer Area**			Effective:	Inactive:
IGETC:	**Transfer Area**			Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Spring 2011	Inactive:	Fall 2019
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:
Upon completion of the course, students will be able to:
1. Solve artificial intelligence, rendering, and animation problems.
2. Create video games of moderate complexity.
3. Discuss common workflow practices in the games industry.
4. Craft compelling resumes and portfolios.
5. Prepare for rigorous and technical interview process.

Topics and Scope:

I. Animation
 1. Frame-based animation
 2. Elapsed game time vs. real time
 3. Particle systems
II. Rendering
 1. Programmable graphics hardware
  a. GPU (Graphics Processing Unit) architecture summary
  b. HLSL (High-level Shading Language)
  c. FX ("effects") files
 2. Real-time lighting models
  a. Lambert’s law
  b. Phong
  c. Blinn-Phong

3. Shader programming
  a. Ambient lighting
  b. Diffuse lighting
  c. Specular lighting
  d. Bump mapping

III. Artificial Intelligence
1. Finite state machines
2. Steering behaviors
  a. Seek
  b. Flee
  c. Pursue
  d. Evade
  e. Flocking: separation, cohesion, alignment
3. Pathfinding A* ("A-star")

IV. Data Driven Development
1. Defining data in XML (Extensible Mark-up Language)
2. Custom content processors in XNA

V. Gameplay Engineering
1. Save and load game state
2. User interface
3. Heads-up display
4. Collision detection and response

VI. Industry Workflow
1. Standard workflows and source control
2. Collaboration with artists and designers
3. Technical interviews
4. Technical resumes
5. Portfolio development
6. Milestones for game development
  a. Concept document
  b. Game design document
  c. Technical design document
  d. Prototype
  e. Production
  f. Alpha
  g. Beta
  h. Gold

VII. Professional Issues
1. Creating resumes and portfolios
2. Technical interviews
3. Preparation for and finding engineering jobs within the game industry

Assignment:

1. Read approximately 25-30 pages a week.
2. Weekly project milestones: students solve iterative programming and workflow problems.
3. Prepare sample questions for technical interviews.
4. In-class technical interviews: students will interview each other.
5. Preparation of a sample resume and portfolio website.
6. Written concept, game design, and technical documentation for a team based final project.
7. Final project: a working game that demonstrates the use of the techniques developed in this class.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written concept and technical documentation	Writing 10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Interative programming, game design, and workflow problems	Problem solving 30 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

In-class technical interviews and final project	Skill Demonstrations 50 - 50%

Exams: All forms of formal testing, other than skill performance exams.

None	Exams 0 - 0%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:

Hall, Joseph. XNA Game Studio Express: Developing Games for Windows and the Xbox 360. Course Technology PTR, 2007.
Lobao, Alexandra Santos. Beginning XNA 3.0 Game Programming: From Novice to Professional. Apress, 2009.
Nitschke, Benjamin. Professional XNA Game Programming. Wrox, 2008.
Reed, Aaron. Learning XNA 3.0: XNA 3.0 Game Development for the PC, Xbox 360, and Zune. O'Reilly Media, 2008.
Instructor prepared materials