1. Title of Course and Course Number:

   CS212  Fundamentals of Computer Graphics and Game Construction

2. Description of the Course Consistent With the WPUNJ catalog

   This course is intended for the student with an interest in computer graphics and games. Fundamentals of game programming in two dimensions will be covered with hands on constructive activities. Types of games will be explored. Graphics programming will be done in a programming language such as Java. Participants in this class will design and run their own game by the conclusion of the course. Prior knowledge of a programming language is required. Topics of study can vary.

3. Course Prerequisites

   A knowledge of programming, preferably in C, C++, or Java

4. Course Objectives

   The main objective of this course is to explore the environment of computer game construction and computer graphics with an emphasis on the following:

   - Review simple games in 2D.
   - Learn graphics techniques in 2D.
   - Learn to construct suitable backgrounds in 2D.
   - Learn animation and how to animate game protagonists.
   - Examine ways to incorporate sound, “artificial intelligence”, physics, visual cues, etc.
   - Learn to synchronize various game elements
   - Participate in discussions of responsibility and ethics.
   - Discuss marketability factors.

5. Student Learning Outcomes

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

   - Design and execute a simple scene generation in 2D
   - Superimpose animation/interaction of one or more simple figures.
   - Synchronize simple game elements.
   - Incorporate rudimentary sounds.
• Demonstrate the ability to think critically. Types of critical thinking include program logic, design decisions (for problems in aesthetics, realism, playability, timing, complexity, concurrency), testing, …
• Locate and use information on these topics.
• Integrate knowledge and ideas in a coherent and meaningful manner.
• Effectively express themselves in written and oral form.

6. Topical Outline of the Course Content

Topics covered in the course will be taken from but not necessarily limited to the following:

• Analysis of simple games in 2D
• 2D Graphics
• Animation in 2D
• Sound Effects and Music
• Simple intelligence and physics programming concepts
• Creating a 2D Platform Game
• Multi Player Games

7. Guidelines/Suggestions for Teaching Methods and Student Learning Activities

Lecture, demonstrations, and hands-on activities
Problem solving sessions
Group work
Written exercises
Programming projects/problems
Inquiry-based instruction.

8. Guidelines/Suggestions for Methods of Student Assessment (student learning outcomes)

Attendance will be taken.
Programs/projects will be assigned.
Written and group activities will be distributed and collected.
Projects will be demonstrated.
All students are expected to take an active role in the learning process.

9. Suggested Reading, Texts, Objects of Study


10. Bibliography of Supportive Texts and Other Materials


Barron, Todd, *Multiplayer Game Programming*, (w/CD), Premier Press (division of Course Technology), Boston, MA 2002.


Buckland, Mat, *AI Techniques for Game Programming* (w/CD), Premier Press (division of Course Technology), Boston, MA 2002.


Morrison, Michael, *Sams Teach Yourself Game Programming in 24 Hours*, SAMS, Indianapolis, IN, 2002.

Morrison, Michael, *Teach Yourself Internet Game Programming With Java in 21 Days*, SAMS, Indianapolis, IN, 1996. (old Java, nice examples)

Mulholland, Andrew and Glenn Murphy, *Java 1.4 Game Programming*, Republic of Texas Press (Wordware), San Antonio, TX, 2003.


Petchel, Thomas, and Andre LaMothe (Editor), *Java 2 Game Programming*, Premier Press (division of Course Technology), Boston, MA 2001.

Phillips, Lorenzo, Game Programming Tricks of the Trade, Premier Press (division of Course Technology), Boston, MA 2002.

Rabin, Steve (Editor), *AI Game Programming Wisdom (w/CD)*, Charles River Media, Hingham, MA, 2002.


Web sites

Game Designer Sites:

GameDev.net - all your game development needs. 7 February 2003. <www.gamedev.net>.


James Blinn Home Page. 7 February 2003. <http://research.microsoft.com/~blinn/>. (a pioneer of computer graphics; site has innovative projects in computer graphics; his three classic books on Computer Graphics augment this)


Academic and Professional Society Sites:


11. Preparers’ Name and Date

12. Original Departmental Approval Date April 22, 2005

13. Reviser’s Name and Date

14. Departmental Revision Approval Date