

WILLIAM PATERSON UNIVERSITY OF NEW JERSEY
COLLEGE OF SCIENCE AND HEALTH
Computer Science Department Course Outline

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

Brackeen, David, Developing Games in Java, New Riders Publishing, Indianapolis, Indiana, 2004.

Bell, Douglas and Parr, Mike, Java for Students, Third Edition, Prentice Hall, Essex, Great Britain, 2002.

10. Bibliography of Supportive Texts and Other Materials

- Ahearn, Luke, and Clayton Crooks II, Awesome Game Creation: No Programming Required (Second Edition), Charles River Media, Hingham, MA, 2002.
- Barron, Todd, Multiplayer Game Programming, (w/CD), Premier Press (division of Course Technology), Boston, MA 2002.
- Bates, Bob, Game Design: The Art and Business of Creating Games, Premier Press, Boston, MA 2002.
- Boer, James, Game Audio Programming, Charles River Media, Hingham, MA, 2002. *
- Bourg, David M., Physics for Game Developers, O'Reilly & Associates, Sebastopol, CA, 2001.
- Buckland, Mat, AI Techniques for Game Programming (w/CD), Premier Press (division of Course Technology), Boston, MA 2002.
- de Sousa, Bruno Miguel, Game Programming All in One, Premier Press, Boston, MA 2002.
- DeLoura, Mark (Editor), Game Programming Gems, Charles River Media, Hingham, MA, 2000.
- DeLoura, Mark (Editor), Game Programming Gems 2, Charles River Media, Hingham, MA, 2001.
- Fan, Joel, Eric Ries, and Calin Tenitchi, Black Art of Java Game Programming, Waite Group Press, Corte Madera, CA, 1996. (old Java, nice examples)
- Feldman, Ari, Designing Arcade Computer Game Graphics, Republic of Texas Press (Wordware), San Antonio, TX, 2002.
- Friedl, Markus, Online Game Interactivity Theory, Charles River Media, Hingham, MA, 2002. (w/extensive CD). *
- Hallford, Neal, and Jana Hallford, Swords & Circuitry: A Designer's Guide to Computer Role-Playing Games, Premier Press, Boston, MA 2001.
- Hardy, Vincent J., Java 2D API Graphics, Prentice Hall, Upper Saddle River, NJ, 1999.