UNIVERSITY OF NEBRASKA AT OMAHA
COURSE SYLLABUS

Department and Course Number	CSCI 2510
Course Title	Introduction to Game Programming
Course Coordinator	Patrick Cavanaugh
Total Credits	3
Repeat for Credit?	No
Date of Last Revision	May 9, 2011

1.0   Course Description Information

   1.1   Catalog description:

   The course will cover programming and development techniques used in a game
   programming environment. The course is designed for students who have an interest in
   game programming to be eased into the concepts in a familiar environment.

   1.2   Prerequisites of the course:

   CSCI 1840

   1.3   Overview of content and purpose of the course:

   This course is the first of a two course track on Game Programming. It will cover
   foundations for Game Programming instructed through the learning of the Game Boy
   Advance environment. Topics such as programming structure, game components, and
   assets will be discussed. Students will also be exposed to what it is like to program for
   dedicated hardware and have an understanding of communication with control registers.

   1.4   Unusual circumstances of the course.

   None

2.0   Course Justification Information

   2.1   Anticipated audience / demand:

   This course is designed for sophomore/junior Computer Science students with an interest
   in Video Game Programming.

   2.2   Indicate how often this course will be offered and the anticipated enrollment:

   This course is offered every other semester with an anticipated enrollment of 20 students.

   2.3   If it is a significant change to an existing course, please explain why it is needed:

   N/A

3.0   List of performance objectives stated in learning outcomes in a student's perspective:

   By completing this course students will be expected:
   - To understand the basic components of a video game
   - To implement the basic structure of a typical video game
   - To create and use sprites and backgrounds in the GBA environment

- To learn to develop on dedicated hardware

4.0   Content and Organization Information

     4.1   List the major topics central to this course:

         4.1.1   Introduction to the Game Boy Advance (GBA) (1 week)
                4.1.1.1 History
                4.1.1.2 Hardware

         4.1.2   Introduction to programming on the GBA (2 weeks)
                4.1.2.1 The Environment
                4.1.2.2 Development Tools
                4.1.2.3 Compilation and running

         4.1.3   Overview of the basics (1 week)
                4.1.3.1 Creating a project
                4.1.3.2 Basic Pixel drawing
                4.1.3.3 Detecting Buttons

         4.1.4   Graphics (4 weeks)
                4.1.4.1 Intro to Bitmaps
                4.1.4.2 Drawing Basics
                4.1.4.3 Drawing Bitmaps
                4.1.4.4 Palettes
                4.1.4.5 Text
                4.1.4.6 Tiles
                4.1.4.7 Backgrounds
                4.1.4.8 Sprites

         4.1.5   Interrupts and Timers (1 week)
         4.1.6   Creating Sound (2 weeks)
         4.1.7   Button Interfacing (2 weeks)
         4.1.8   Final Project Touch-ups and Demonstration (2 weeks)

5.0   Teaching Methodology Information

     5.1   Methods:

         The material is taught through lectures based on slides as well as in class examples.

     5.2   Student role:

         Students will learn the techniques necessary to program on the GBA, and demonstrate their knowledge through coding assignments.

6.0   Evaluation Information

     6.1   Describe the typical types of student projects that will be the basis for evaluating student performance:

Evaluation will be based primarily on student work. Students will be required to create small examples of material learned, as well as a final project, that will entail using all concepts learned in the class to create a full game.

6.2   Describe the typical basis for determining the final grade (e.g. weighting of various student projects):

The final grade will be determined assignment projects and the final project. The final project will account for approximately 30% of the final grade.

6.3   Grading type:

A+	97% - 100%	4.00 GPA
A	93% - 96%	4.00 GPA
A-	90% - 92%	3.67 GPA
B+	87% - 89%	3.33 GPA
B	83% - 86%	3.00 GPA
B-	80% - 82%	2.67 GPA
C+	77% - 79%	2.33 GPA
C	73% - 76%	2.00 GPA
C-	70% - 72%	1.67 GPA
D+	67% - 69%	1.33 GPA
D	63% - 66%	1.00 GPA
D-	60% - 62%	0.67 GPA
F	0% - 59%	0.00 GPA

7.0   Resource Material Information

7.1   Textbooks and/or other required readings used in course:

7.1.1   Instructor created slides

7.1.2   Online Text: Jonathan Harbour. "Programming The Nintendo Game Boy Advance." Retrieved from http://www.theharbourfamily.com/jonathan/?page_id=89

7.2   Other student suggested reading materials:

J Vijn. Untitled. Retrieved from http://www.coranac.com/tonc/text/

7.3   Current bibliography and other resources:

7.3.1   Jonathan Harbour. "Programming The Nintendo Game Boy Advance." Retrieved from http://www.theharbourfamily.com/jonathan/?page_id=89

7.3.2   J Vijn. Untitled. Retrieved from http://www.coranac.com/tonc/text/

7.3.3   Loirak. "Gameboy Advance Programming for Beginners." Retrieved from http://www.loirak.com/gameboy/gbatutor.php

7.3.4   GBAjunkie. "Tutorials." Retrieved from http://gbajunkie.co.uk/

7.3.5   Neogeo. "GameBoy Advance C/C++ Programming Tutorial." Retrieved from http://home.no/neogeo/HOVEDSIDE_INDEX/GBA_HOVEDSIDE_INDEX_ENGELSK/index.html

7.3.6   Foley, van Dam, Feiner, Hughes. *Computer Graphics: Principles and Practice in C.* Addison-Wesley Professional.

7.3.7   Deitel & Deitel. *C How to Program, Sixth Edition.* Boston, MA: Prentice Hall.

7.3.8   Kernighan, Ritchie. *The C Programming Language, 2nd Edition.* Boston, MA: Prentice Hall.

7.3.9   Dille, Platten. *The Ultimate Guide to Video Game Writing and Design.* Lone Eagle.

7.3.10 Thompson,Berbank-Green,Cusworth. *Game Design: Principles, Practice, and Techniques.* Hoboken, NJ: Wiley.

8.0   Other Information:

8.1   Accommodations statement:

8.2   Other:

8.3   Author(s):

Patrick Cavanaugh

9.0   Computer Science Accreditation Board (CSAB) Category Content (class time in hours):

CSAB Category	Core	Advanced
Data structures	2.5	
Computer organization and architecture	5	2.5
Algorithms and software design	15	10
Concepts of programming languages	5	

10.0   Oral and Written Communications:

Every student is required to submit at least 1 written reports (not including exams, tests, quizzes, or commented programs) to typically 5 pages and to make 1 oral presentations of typically 15 minutes duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.

11.0   Social and Ethical Issues:

When discussing game creation, acceptable content will be discussed.

12.0   Theoretical content:
Please list the types of theoretical material covered, and estimate the time devoted to such coverage.

1. Game Boy Advance Environment   2.0

2. Hardware interaction   3.0

3. Basic Graphics theory	4.0
4. Creating Bitmaps	4.0
5. Graphics palettes	3.0
6. Drawing Text	4.0
7. Sprite manipulation	6.0
8. Scrolling Backgrounds	6.0
9. Interrupts and Timers	2.0
10. Final Project Design	6.0

13.0 Problem analysis:
Please describe the analysis experiences common to all course sections.

Any kind of coding requires problem analysis. What tools to use to best solve a problem and how to make it efficient are discussed.

14.0 Solution design:
Please describe the design experiences common to all course sections.

Besides the given assignments with well defined tasks, students will also be required to design and create their own game, on their or own or within a group environment.

CHANGE HISTORY

Date	Change	By whom	Comments
2/25/06	Initial Creation for Special Topics	Cavanaugh	
9/30/08	Updated for course number, added Change History and Outcomes vs. Objectives table	Cavanaugh	
2/14/11	Update prereq, student valuation, and general rewording	Cavanaugh	
5/9/2011	Revised for new format	Cavanaugh	

S – Strong relationship
X – Contributing relationship

Course objective	(a) knowledge of discipline	(b) analyze problem, define requirements	(c) design and implement solution	(d) function on a team	(e) ethical issues	(f) communicate effectively	(g) analyze impact of computing	(h) continued professioanl development	(i) Current techniques and tools	(j) apply foundations	(k) apply design and development principles
Environment									X		X
Hardware	X								X		X
Graphics Theory										X	X
Bitmaps			X							X	
Palettes			X							X	
Text			X							X	
Sprites		X	X						X	X	X
Backgrounds		X	X						X	X	X
Interrupts and Timers	X	X								X	
Project Design		X	X	X		X		X	X	X	X