



# 71-410-1

## Video Game Programming I

Fall 2015  
MWF 11:00-11:50am  
Classroom: AS-102A

**Instructor:** Dr. Dana Dominiak  
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[ddominiak@webfootgames.com](mailto:ddominiak@webfootgames.com)

**Office:** AS-130L  
**Office Phone:** 815-836-5819

**Office hours:** MWF 12– 1 p.m.  
and by appointment

### COURSE

- Credit hours: 3
- Catalog description:  
*This course will expand on 70-410. Students will learn how to write 2D games for a variety of platforms and 3D games for PCs and popular consoles. They will use APIs and modeling tools for developing games in 3D and games for portable and other non-PC platforms. In addition, they will simulate physical systems and intelligent thought processes using vector math, mechanics and artificial intelligence. Work will be done in teams.*
- Prerequisites: 70-210 Programming and Data Structures



*Lewis University is a Catholic University in the Lasallian Tradition. Our Mission is integrated into all aspects of University life, including this course. This course embraces the Mission of the University by fostering an environment in which each student is respected as an individual within a community of learners. In the spirit of the vision of Lewis University, the goals and objectives of this course seek to prepare students to be successful, life-long learners who are intellectually engaged, ethically grounded, socially responsible, and globally aware.*

## COURSE RATIONALE

- Video Games and the closely related fields of Real-time Simulations and Computer Graphics have grown into major industries which continue to grow. This course offers students a real-world team experience in creating a video game simulation.



## STUDENT LEARNING OUTCOMES

- By the end of the semester, students will have designed, programmed, and debugged a complete small video game. Students will understand the process by which commercial video games come to market, from answering Requests for Proposals, to writing General Design Documents and Technical Design Documents. Servers and tools will be utilized to aid in the creation of the game, such as version control systems and bug tracking servers. Students will learn to create related assets such as level data, custom tools, artwork, sounds, and icons.
- Student learning outcomes are evaluated through successful completion of a video game programming project.

## RELATIONSHIP TO MISSION

- The demanding field of computer science requires that students gain significant experience, **knowledge** and **wisdom** in a variety of fields while working together in **association** in a productive team-oriented environment. I have **faith** that students will follow the letter and spirit of this class syllabus, which **justifies** the time I am spending preparing this course!



## TEXTBOOK AND INSTRUCTIONAL MATERIAL

- C++ Programming Language (hardcover), The, 4/E  
Bjarne Stroustrup ISBN-10: 0321958322 • ISBN-13: 9780321958327
- **Blackboard:** students must login before each class to read latest updates and course announcements.

## COURSE OUTLINE AND SCHEDULE

A survey of game hardware:

Request for Proposal / Proposal Document

Overview of C++, Python and Pygame

C++ Fundamentals

C++ Programming

Game Design Document/Technical Design Document

C++ Game libraries

Bitmaps, Bitmap Formats (historic PCX, PNG, JPG, other), Color  
Palletes, RGB, Alpha

Video Memory, Screen Buffers, Video Hardware

Screen Coordinates

Fonts

GUIs

Sprites, Animated Sprites, Data Structures

I/O: CD/DVD, Cartridge/ROMs/EEPROM

Controllers: Mouse, Joypad, Accelerometers, etc.

Memory Managers

Sound and Music: PCM, WAV, MP3, OGG

AI – A brief overview

Data Structures for Video Games

The Main Loop

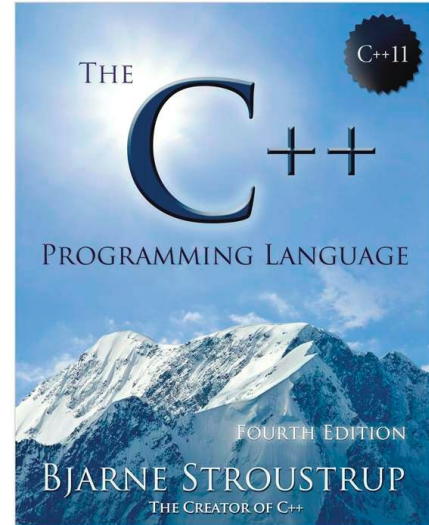
Sound: OpenAL

Physics Engines: Havok, Box2D

3D Frameworks: OpenGL, Direct3D

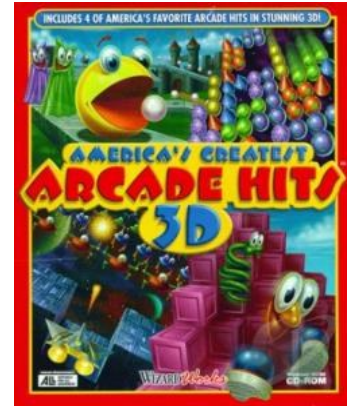
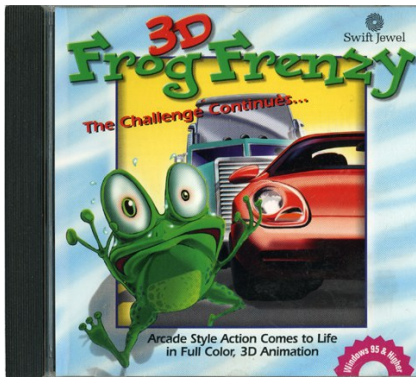
Others: Unity, SDL, Unreal

- The Final Exam will take place:  
12/18/2015 Friday, 10:30 a.m. - 12:30 p.m.



## COURSE REQUIREMENTS

- Class attendance.
- Successful completion of **all** programming assignments, on time.
- Passing grades on the Mid-term and Final Exam.
- Passing grades on all quizzes.
- Adequate class participation.
- **Original programming work. No copying source code from the internet or other students or anywhere else.**

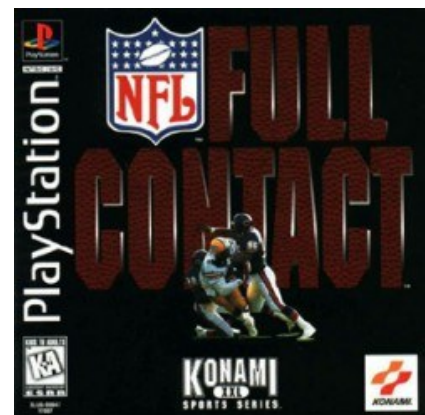


## GRADING POLICY

- Grades will be based upon successful completion of the course requirements using the point system and scale shown below.

MP1: Pong	50 points
MP2: Breakout	100 points
Midterm:	150 points
Final Exam:	200 points
Total:	500 points*

- The following approximate scale is used:
  - A ..... 90% and above
  - B ..... 80 – 89%
  - C ..... 70 – 79%
  - D ..... 60 – 69%
  - F ..... below 60%



*\*Depending on the class performance, one to six quizzes worth 50 points each may be given.*



## COURSE POLICIES AND PROCEDURES

- **Class attendance policy:** This course is primarily graded on in-class projects, therefore, attendance is required. It has been my experience that students who do not attend the lectures have an extremely difficult time with assignments and exams. Each student is responsible for obtaining all class materials or missed lecture notes. Each student is responsible for obtaining access to a computer and compiler. Machine problems and exams are based almost entirely from class lectures.
- **Academic honesty:** Scholastic integrity lies at the heart of Lewis University. Plagiarism, collusion and other forms of cheating or scholastic dishonesty are incompatible with the principles of the University. Students engaging in such activities are subject to loss of credit and expulsion from the University. (2013-2014 Undergraduate Catalog, p. 43).

## ▪ **Respect:**

Expressions of racism, sexism, misogyny, heterosexism, homophobia, trans-phobia, age-ism, able-ism, and religious discrimination (e.g. Islamophobia, anti-Semitism) violate the right that others have to be respected as fellow community members. This learning space is an extension of Lewis University's Sanctified Zone, a place where people are committed to working to end racism, bias and prejudice by valuing diversity in a safe and nurturing environment. This active promotion of diversity and the opposition to all forms of prejudice and bias are a powerful and healing expression of the desire to be Signum Fidei, "Signs of Faith," in accordance with the Lewis Mission Statement. To learn more about the Sanctified Zone, please visit: [www.lewisu.edu/sanctifiedzone](http://www.lewisu.edu/sanctifiedzone).



- **Policies regarding make-up examinations and late submission of assignments:**  
Contact the instructor for scheduling make-up exams. **Late assignments will be lowered by 1 letter grade for each day late.** Assignments more than 5 days late will receive a 0 for a grade.
- **Drop and withdrawal deadlines** (see semester *Course Schedule*)
- **Classroom behavior expectations** (consistent with "Classroom Decorum" statement from *Student Handbook* on page 15). Students are expected to remain respectful to the instructor and other students at all times.
- **Other policies:**
  - **No cell phone use** in the classroom. No texting or checking email on cell phones during class. Your cell phone should be off and stored in a backpack, purse, or pocket.
  - Students are expected to bring a notebook and take notes from instructor during class lecture.



## ASSISTANCE

- Assistance: The instructor is available to help students having difficulty. It is the responsibility of the student to approach the instructor to ask for help.
- Assistance is also available through LARC (Leckrone Academic Resource Center) for students requiring special accommodations.
- Students requiring special accommodations must submit documentation to LARC staff prior to the start of class or within the first week of class.



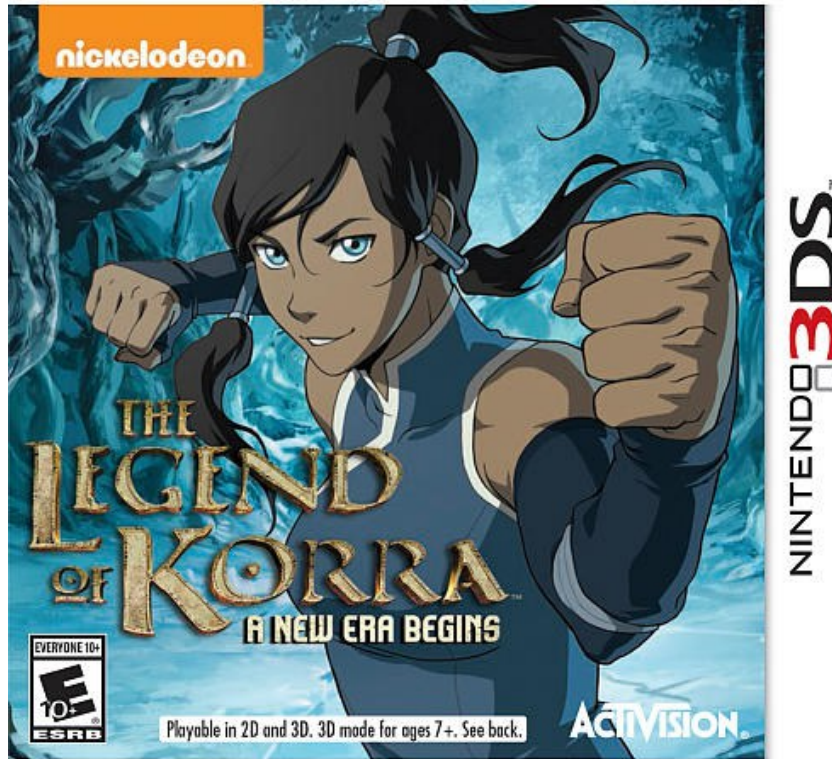
## SUPPLEMENTARY MATERIALS

- Recommended websites
  - <https://www.khanacademy.org/>
  - <https://handmadehero.org/>
  - <http://www.gamedev.net/page/index.html>
  - <http://slashdot.org/>
  - <http://www.ign.com/>
  - <http://www.gamespot.com/>
  - <http://www.webfootgames.com/>



*"You are in a maze of twisty passages, all alike."*

"xyzzzy"



**PLEASE NOTE THAT THIS SYLLABUS IS SUBJECT TO REVISION  
IF THE NEED ARISES**

**Students are expected to be familiar with the  
*Lewis University Copyright and Intellectual  
Property Guidelines*, posted electronically on the  
Lewis University Website.  
[www.lewisu.edu/academics/library/index.htm](http://www.lewisu.edu/academics/library/index.htm)**