

CSCI 330 – Spring 2015

Game Programming

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Course Description

Computer games are large programs that utilize concepts from the breadth of the computer science curriculum along with various mathematic concepts. This course considers how to plan, organize, and carry out the creation of a computer game. Topics include using game engines and other libraries in large projects, software engineering for games, the mathematics of game programming, artificial intelligences for games, event-based programming, and 2D graphics.

Course Goals

Upon completion of this course, a successful student will be able to:

- Design a large game:
 - using proper orthogonality
 - with cohesive program units
 - with object interfaces that enforce abstraction and encapsulation
 - using the Model-View-Controller and other appropriate design patterns
 - in an event-based and real-time context
- Solve problems in a local coordinate system using vector-based computations
- Apply artificial intelligence techniques to produce appropriate game agent behavior.

Course Texts

In addition to a traditional book, we will use a collection of article and videos.

- *Programming Game AI by Example* by Mat Buckland. This book is available through the bookstore or through various online sources.

You should expect to spend at least an hour before each class session working through the material. For readings, this means reading the text for detail, not just skimming through the material before class. For the videos, you should obtain the examples and make changes to see how everything works.

Graded Material

- **Homework** - The goal of homework problems is for you to practice using the current course content and to explore the topics in more detail. Problems will be assigned regularly during the first half of the semester.

Homework problems will be graded on a scale between zero and three:

- **3**: You completed the problem perfectly or nearly perfectly.
- **2**: Your solution had non-trivial problems.
- **1**: You tried the problem, but either didn't get very far or made serious mistakes.
- **0**: You failed to turn anything in for the problem.

At the end of the semester, your average homework problem score will translate into an actual letter grade as follows:

≥ 2.5	A
≥ 2	B
≥ 1.5	C
≥ 1	D
< 1	F

Essentially, this scale means that you must earn threes on at least half of the problems to be in the A range (with the remainder of your scores being twos). Plusses and minuses will be used within each range.

- **Programs** – You will be assigned four or five programming tasks that require you to implement small, game-like applications, and you will be given approximately two weeks to finish each one. You should not plan to complete these programs in a single sitting, but rather complete them in a number of shorter sessions.

For each of these assignments you will demonstrate your program to the rest of the class. Each assignment will have a set of base functionality, and if your program correctly implements these requirements you will earn a 'B.' To earn a higher grade you must earn "glamour points," based on additional functionality. Details of how to earn glamour points will be included in the first programming assignment.

- **Project** – During the second half of the semester you will work on a complete game. You will have freedom to choose the game genre, programming language, libraries, and features of your game – subject to a checklist of features that all games must include. This list will contain concepts from the homework and programming assignments.

This assignment will take the place of a final exam for the course, and you will demonstrate your game during the final exam period on Monday, May 4 at 1:30 p.m. Your grade for this assignment will be based on the number of required and optional features completed.

- **Test** – One test will be given during the semester on Wednesday, March 4. You may only re-schedule a test for college-approved absences or documented illness. In either case, you must contact me *before* the beginning of the test.

Grade Determination

- Homework – 20%
- Programs – 40%
- Project – 30%
- Test – 10%

Course Policies

- **Late Policy** – I understand that life sometimes gets in the way of getting work done. Consequently, late assignments will be accepted without penalty in the class after the assignment was due. However, this policy should not be used as a crutch, and if you frequently use it I will deduct from your grade. After the next class session, late work will not be accepted unless there are exceptional circumstances.
- **Extensions** – In a similar vein, I am generous with extensions on work if you approach me *before* the day the assignment is due.
- **Absences** – Your attendance is expected at each class meeting, but I understand that students occasionally get sick, have obligations outside Moravian, and even over sleep. If you do miss class, please send me an email explaining your absence – preferably before the class session. Regardless of your reason for missing class, you are responsible for the contents of reading assignments, handouts, class activities, and class email.
- **Academic Honesty** – Except on tests, you are *encouraged* to discuss the material and work with other students in the course. Specifically, on homework and programming assignments you may discuss any portion of the assignment with your fellow students. This policy does not allow you to copy another student’s work verbatim – you must produce your own code or write-up of the material. Work together to learn the concepts, but keep in mind that you are ultimately responsible for the material on the tests.
- **Disabilities** – Students who wish to request accommodations in this class for a disability should contact the Assistant Director of Academic and Disability Support in the Academic Support Center, Monocacy Hall, lower level, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

The details of this syllabus and schedule are subject to change based on our progress through the material.