

# CSCI 321: Introduction to Computer Game Development

## Syllabus, Spring, 2015

**Instructor:** Geoffrey Matthews, x3797, geoffrey dot matthews at wwu dot edu

**Office hours:** MTWF 10:00-10:50, CF 469

**Lectures:** MTWF 9:00-9:50am, CF 227

**Webpages:**

- <https://www.instructure.com>
- <https://github.com/geofmatthews/csci321>

**Content:** This class is an introduction to the design, programming, ethics, and business of computer games. Topics include:

- Game design
- Game architecture
- Graphics
- Physics and simulations
- Game AI (artificial intelligence)
- Game Story
- Game Mechanics
- Social aspects of games

**Course objectives:** At the end of this class the student should be able to:

- Understand basic game architecture:
  - Game loop
  - Game timing
  - Event oriented programming
- Understand basic nonplayer character AI:
  - State oriented behavior
  - Autonomous motion
  - A\* search
  - Goal driven behavior
- Understand blitting and 2D graphics, transparency, animated sprites
- Understand the basics of 3D computer graphics
- Understand the basics of 3D animation, character modeling, rigging and skinning
- Understand the basics of 2D and 3D physics necessary for games:
  - Understand tradeoffs in numerical integration techniques
  - Collision detection, resolution, and response
- Use Python and Pygame to produce a 2D game
- Use Blender gamekit to produce a 3D game, including 3D content
- Understand the elements of storytelling and drama:
  - Character
  - Conflict
  - Plot
- Use Inform 7 to produce an interactive fiction game
- Understand the basics of the game industry today, job titles, responsibilities, *etc.*
- Understand the social issues of games, such as game violence, addiction, griefing, and hacking.

**Exams:** One midterm and one final. All exams will be closed book, except that you may bring two sheets of paper with information on them to be used during the exams.

**Quizzes:** Except for the first and last weeks of class and exam days, we will have weekly quizzes on Fridays. Closed book and notes.

**Reading:** All students are expected to do the reading assigned throughout the quarter in order to be prepared for the weekly quizzes and the exams.

**Games:** There will be three game programming assignments: a 2D game in python and pygame, a 3D game in Blender3D, and an IF (interactive fiction) game in Inform 7

**Game Journal:** All students are required to play at least 2 hours of games every week. You must keep a journal on games, hours, *etc.* More detailed instructions will be handed out in class. Game journals are due every week except the last week (dead week) by midnight on Sunday

**Late work:** Submissions are due before midnight of the due date. Anything turned in later than that time will be accepted with a 25% penalty per day (or fraction of a day). Anything more than 3 days late will not be accepted. It is your responsibility to make sure all assignments are correctly submitted.

**Attendance policy:** Attendance is required. Studies show that regular attendance is highly correlated with performance. I will take attendance from time to time, and attendance will be worth up to 5% bonus points on your final exam.

You are responsible for all material covered in the lectures, books, handouts, or other assigned reading else. If you miss a lecture, make sure you get notes from another student.

If you have a well documented emergency (illness, military service, school sponsored athletic events, *etc.*) notify your instructor as soon as possible and present documentation (a note from your mother is not sufficient). The instructor may, at his discretion, extend the due date for the assignment, schedule a make-up exam, or simply adjust your remaining scores to determine your grade.

**Grading:** Grades will be based on the three games you produce, game journal, weekly quizzes, a midterm, and a final exam. There are no extra credit opportunities for this class. Relative weighting of the various assessments and assignment of plus and minus is at the discretion of the instructor.

$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$

Game journal	10%
Quizzes	10%
Midterm	10%
Final	20%
2D pygame game	20%
3D Blender game	20%
Inform7 game	10%

### Texts and Readings:

- Python and Pygame
  - <http://inventwithpython.com/>
  - <http://programarcadegames.com/>
- Artificial Intelligence
  - Programming Game AI by Example (in bookstore).
- Game Physics
  - <http://gafferongames.com>
  - [http://graphics.stanford.edu/courses/cs448b-00-winter/papers/phys\\_model.pdf](http://graphics.stanford.edu/courses/cs448b-00-winter/papers/phys_model.pdf)
  - [http://www.gamasutra.com/view/feature/3429/crashing\\_into\\_the\\_new\\_year\\_.php](http://www.gamasutra.com/view/feature/3429/crashing_into_the_new_year_.php)
  - [http://www.gamasutra.com/view/feature/3426/when\\_two\\_hearts\\_collide\\_.php](http://www.gamasutra.com/view/feature/3426/when_two_hearts_collide_.php)
  - [http://www.gamasutra.com/view/feature/3427/collision\\_response\\_bouncy\\_.php](http://www.gamasutra.com/view/feature/3427/collision_response_bouncy_.php)
  - [http://www.gamasutra.com/view/feature/3190/advanced\\_collision\\_detection\\_.php](http://www.gamasutra.com/view/feature/3190/advanced_collision_detection_.php)
- Blender3D
  - <http://www.cdschools.org/Page/455> (use the 4th edition)
  - [http://en.wikibooks.org/wiki/Blender\\_3D:\\_Noob\\_to\\_Pro](http://en.wikibooks.org/wiki/Blender_3D:_Noob_to_Pro)
  - <http://blendercourse.com/>
  - [http://en.wikibooks.org/wiki/Blender\\_3D:\\_Noob\\_to\\_Pro/Platformer:\\_Creation\\_and\\_Controls](http://en.wikibooks.org/wiki/Blender_3D:_Noob_to_Pro/Platformer:_Creation_and_Controls)
  - [http://en.wikibooks.org/wiki/Blender\\_3D:\\_Noob\\_to\\_Pro/An\\_aMAZEing\\_game\\_engine\\_tutorial](http://en.wikibooks.org/wiki/Blender_3D:_Noob_to_Pro/An_aMAZEing_game_engine_tutorial)
  - <http://wiki.blender.org/index.php/Doc:2.6/Manual>
- Other readings as assigned.

**Schedule:**

	Su	Mo	Tu	We	Th	Fr	Sa	Topic	Deadlines
April	29	30	31	1	2	3	4	Pygame	
	5	6	7	8	9	10	11	Pygame, Physics	
	12	13	14	15	16	17	18	Physics	
	19	20	21	22	23	24	25	Blender3D	
May	26	27	28	29	30	1	2	Physics	2D game due Wednesday
	3	4	5	6	7	8	9	AI	Midterm Wednesday
	10	11	12	13	14	15	16	Inform7, Story	
	17	18	19	20	21	22	23	AI	3D game due Wednesday
June	24	25	26	27	28	29	30	AI	
	31	1	2	3	4	5	6	Social Issues	Inform7 game due Wednesday
	7	8	9	10	11	12	13		Final Wednesday 8:00am

**Academic dishonesty:** Academic dishonesty policy and procedure is discussed in the University Catalog, Appendix D. All students should read this section of the catalog. Academic dishonesty consists of misrepresentation by deception or other fraudulent means. In computer science courses this frequently takes the form of copying another's program, either a fellow student's program, or copying one from the web. Due diligence should be exercised in the labs at all times, since both copying and letting someone else copy your program are equally culpable. Do not walk away from your computer in the lab without logging out or locking the screen. Do not print out code and then throw it away in the lab trash cans. Do not share files, even if it is just to "show them something." Describe it in words, or talk to them in person, never share code.

**Collaboration:** Collaboration with your fellow students is a good way to learn. Feel free to share ideas, solve problems, and discuss your programs with other students. However, collaboration is *not* copying. All code should be original. Remember the **Long Term Memory Rule**: After discussing homework with another student, each of you must destroy all written notes, pictures, files that you shared, erase the board, *etc.*. After that, you must watch a rerun of *the Simpson's*, play a round of ping-pong, go for a walk, or do something else unrelated, for half an hour. Then you can take the knowledge you gained from another student and put it to work, since it is now not copying, but learning. You have made it your own.