

CIS 580 - Foundations of Game Programming Fall 2016

Class Time & Location: Monday, Wednesday, & Friday 2:30-3:20pm, DUE 1116

Final Exam Period: Friday, December 16, 4:10pm to 6:00pm

Instructor: Nathan Bean

Email: nhbean@ksu.edu

Office Hours & Location: Tuesday 3:30-4:30pm or by appointment (<https://schedule.cs.ksu.edu>), DUE 2216

GTA: Adedolapo Okanlawon

Office Hours & Location: Friday 3:30pm-4:30pm, DUE 1119

Course Description

Fundamental principles of programming games. Foundational game algorithms and data structures. Two-dimensional graphics and physics simulation. Development for multiple platforms. Design of multiple games incorporating topics covered.

Prerequisite

CIS 501, MATH 221, and a physics course

Course Resources

Course Textbooks:

- Game Programming Patterns (GPP), <http://gameprogrammingpatterns.com>
- Procedural Content Generation in Games (PCG), <http://pcgbook.com>
- *[optional]* 3D Math Primer for Graphics and Game Development (2nd edition), Fletcher Dunn and Ian Parberry, ISBN 978-1568817231

Online Resources

- Mozilla Developer Network, <https://developer.mozilla.org/en-US>
- Math for Game Developers Video Series, <https://www.youtube.com/playlist?list=PLW3ZI3wyJwWOpdhYedID-yCB7WQoHf-My>

Course Software

For this course, we will be using a combination of HTML5 technologies, as well as:

- A code editor or IDE (Notepad++, Atom, VSCode)
 - Notepad++ <https://notepad-plus-plus.org/>
 - Atom <https://atom.io/>
 - Visual Studio Code <https://code.visualstudio.com>
- A web browser with strong developer toolkit (Chrome, Firefox, or Edge)
- A vector graphics editor (Inkscape, Adobe Illustrator)
 - Inkscape is an open-source SVG editor <https://inkscape.org/en/>
 - Adobe Creative Suite is available at a student rate here: <https://www.k-state.edu/its/software/software-licenses/>
- We will be using Github Classroom for sharing assignment template code as well as turning in assignments, so you will need to have a Github student account. Once signed into Github, visit this url: <https://classroom.github.com/classrooms/21157466-cis-580-foundations-of-game-programming>

Course Goals

This course is intended to introduce the fundamentals of creating computer game systems. Computer games are uniquely challenging in the field of software development, as they are considerably complex systems composed of many interconnected subsystems that draw upon the breadth of the field - and must operate within real-time constraints. For this semester, my goals for you as a student are:

1. To develop a broad understanding of the algorithms and data structures often utilized within games.
2. To recognize that there are many valid software designs, and to learn to evaluate them in terms of their appropriateness and trade-offs.
3. To expand your games portfolio with fun, engaging, and technically sophisticated games of your own devising.
4. To practice the software development and communication skills needed to participate meaningfully within our industry.

All of our activities this semester will be informed by these goals. Course assessments (grades) will also be driven by these goals.

Course Structure

Careful management of time is important to succeeding in this course - creating games is a lot of work, and we have many topics to cover. Coursework is divided into four categories: assigned readings, in-class work, individual game projects, and team game projects.

Assigned Readings

The KSOL page lists readings from the course texts for most days. It is your responsibility to have read and studied these readings. Class time will not be a reiteration of this content, but rather additional coverage specific to our goals, so if you have not read the preparatory material you will quickly get lost and sabotage your learning. I have deliberately chosen well-written, engaging, and inexpensive (free) reading materials to make this easier for you.

In-Class Work

As part of our learning strategy, we will implement many of the topics we discuss within the class period. The goal of these exercises is not necessarily to complete a game (though this will happen), but rather to tackle the course topics in a hands-on manner while both I and our TA are available to assist. Accordingly, we will be assigning some grades for participating in these exercises.

Individual Game Projects

The first half of our semester consists of writing a series of arcade games individually. Individual work is exactly that - you may discuss your ideas and direction with other students but do not share your code on these assignments. Any evidence of shared code on an individual assignment will lead to your dismissal from the course for academic dishonesty. The focus of individual assignments is to develop your knowledge and skills as a game programmer; failing to complete them shortchanges you on this learning.

Group Game Projects

For the second half of the semester, we will form teams to develop a number of games proposed by you and your classmates. Each student will present an original game idea to the class, and we will break into teams to bring some of these ideas to life. Every team member is expected to contribute equally to the final project, and grades will be adjusted based on peer reviews and instructor observations. These group projects will also serve in lieu of a final examination - during our final examination period each team will

present their game to the class. Attendance for the final presentation is mandatory, just as it would be for a final exam!

Grading Breakdown

In-Class Work	20%
Individual Projects	40%
Group Projects	40%

Attendance Policy

Class time is split between two activities – class discussions, and in-class work where you have the opportunity to work on your software with myself and your classmates as resources to draw upon. For both these purposes to be effective, it is vital for that you attend and participate in each and every class. While we will not take attendance directly, absences will be reflected in your In-Class work grade. Students who must miss a class should still make every effort to coordinate with their team members to ensure their development process is unhindered.

Academic Honesty

Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The honor system website can be reached via the following URL: www.ksu.edu/honor.

A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

Games face a number of challenges most other assignments don't – they incorporate multimedia assets, code assets, and many other elements. Because these become a part of the game, the game itself becomes a derivative work – so citing your source material is no longer sufficient. Please be aware of copyright law, and that including copyrighted works that you do not have a license or other permission to use within your game is both illegal and will be viewed as academic dishonesty. Licenses to any material you use should be included in a "license" folder within the project itself, and licensed material needs to be clearly identified.

Students with Disabilities

"Any student with a disability who needs a classroom accommodation, access to technology or other academic assistance in this course should contact Disability Support Services (dss@kstate.edu) and/or the instructor. DSS serves students with a wide range of disabilities including, but not limited to, physical disabilities, sensory impairments, learning disabilities, attention deficit disorder, depression, and anxiety."

Expectations for Classroom Conduct

All student activities in the University, including this course, are governed by the Student Judicial Conduct Code as outlined in the Student Government Association By Laws, Article VI, Section 3, number 2. Students that engage in behavior that disrupts the learning environment may be asked to leave the class.

Campus Safety

Kansas State University is committed to providing a safe teaching and learning environment for student and faculty members. In order to enhance your safety in the unlikely case of a campus emergency make sure that you know where and how to quickly exit your classroom and how to follow any emergency directives. To view additional campus emergency information go to the University's main page, www.kstate.edu, and click on the Emergency Information button.