Applied Coding for Game Design
GAME140 – Fall 2019 – Online

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Office Hours*: MW 3:30 pm – 5:00 pm
* Other times by appointment (Tues., Thurs., and Fri. are best for appointments). The best way to reach the instructor is via email.

Mason Mission Statement
Mission-Who we are and why we do what we do
A public, comprehensive research university established by the Commonwealth of Virginia in the National Capital Region, we are an innovative and inclusive academic community committed to creating a more just, free, and prosperous world.

Mason Game Design Mission Statement
The Mission of the Computer Game Design Program at George Mason University is to prepare students for employment and further study in the computer game design and development field, doing so with a curriculum designed to reflect the gaming industry’s demand for an academically rigorous technical program coupled with an understanding of the artistic and creative elements of the evolving field of study.

Catalog Description
This class covers basic programming concepts, data structures, and techniques specifically relevant to game design. The techniques covered in this class will provide a fundamental understanding of programming with regards to game design that is independent of any particular engine or toolset.

Course Overview
In this course, you will learn the fundamental techniques necessary to build basic text-based and 2D games using C/C++ without relying on a game engine. Through this process, you will learn how to organize game-relevant data and break-down game designs into logical, implementable chunks. This course serves as an introduction to programming techniques that can be applied across a variety of toolsets used in game development.
Student Learning Objectives
Upon completion of this course, students will:

- Recognize and use basic programming features like loops, branching, and variables
- Use the Visual Studio debugger to debug errors in their programs
- Decompose game feature specifications into implementable rules
- Apply basic coding skills to implement simple text-based and 2D sprite-based games
- Use basic object-oriented programming techniques to add functionality to existing classes
- Use 2D vector arithmetic to implement game object behaviors

Required Texts
There’s no required text for this course. Necessary materials will be distributed online if applicable.

Required Software
Students will be required to have access to the following software in order complete the required assignments:

- Windows 7+
- Visual Studio Community 2019

In addition, students will need access and ability to produce 2D game art on a suitable graphics program like Adobe Photoshop / Illustrator. The usage of this software will not be specifically covered in-class.

Course Structure
This course is structured around six major programming projects of varying lengths.

Each Unit of this course represents one of these projects. A Unit is made up of 1 or more lessons that will teach you the basic concepts you need to complete that Unit’s project. At the beginning of a Unit, you will be briefed on the project of that Unit. After completing all the lessons in a Unit, you will have all the information you need to successfully complete that Unit's project. Many of the projects can take a while to complete so I recommend you work on them over the course of their Unit. I would NOT recommend waiting until a Unit is complete to start work on that Unit's project. You are expected to complete and turn-in your project at the end of a Unit before moving to the next Unit. You should proceed through the Units (projects) in order as the later projects build on the skills practiced in the previous projects.

The Units / projects that make up this course are:

Unit 1: Self-Intro and Visual Studio Orientation (1 week)
You will setup your development environment and introduce yourself with a very simple program.

Unit 2: Text Battle (2 weeks)
You will implement a simple RPG-like turn-based battle using console (text) output.

Unit 3: Text Adventure (2 weeks)
You will create a text-based adventure game where a player moves between rooms and interacts using text commands.

**Unit 4: ASCII Dungeon (3 weeks)**
You will create a text-based dungeon made up of virtual rooms filled with interactive objects represented with ASCII symbols.

**Unit 5: Intro to SDL (2 weeks)**
You will create a simple animation using sprites and the Simple DirectMedia Layer (SDL).

**Unit 6: 2D Dungeon Game (4 weeks)**
You will create a 2D sprite-based dungeon game where a player moves around and interacts with objects in real-time. You will complete this project in lieu of a final exam.

**Types of Coursework**
There are three major types of work that you will do in this course: Projects, Lessons, and a One-on-One Code Review.

**Projects**
These are major programming projects that you will be completing during this course. Each Project corresponds to a Unit of this course and most take multiple weeks to complete. You will expected to complete a Unit’s Project before proceeding to the next Unit. You are expected to work on a Project during the entire course of its corresponding Unit. I strongly recommend that you do NOT wait until the end of a Unit to start working on its project.

**Lessons**
Each Unit is made up of multiple lessons. A lesson will generally have some lecture material (like a video) as well as a short, graded activity (like a quiz) related to the lesson material. You are expected to complete all the graded lesson activities in this course.

**Project Demos**
At certain scheduled times in the course, we will have Project Demo meetings. There will be one meeting for each project. During these meetings, volunteers will demo their projects for the meeting. You are required to demo 4 times out of the 6 demo meetings. You do NOT have to attend every meeting, but you do need to demo your projects the requisite number of times. Of the demos, the first demo (Self-Intro project) is required.

**Multiple Attempt and Late Submission Policy**
For Graded Lesson Activities
In general, I will accept multiple submissions for assignments and quizzes that are embedded in lessons. I will use the latest attempt for calculating your grade.

So, if you were to take a quiz and miss a question, by all means, TAKE IT AGAIN to improve your grade!
For Projects
Unlike graded lesson activities, projects have set deadlines. YOU MUST submit your project by the deadline. If you need an extension on the deadline, let me know and we can work something out.

I accept multiple submissions on projects. If you want to submit a nominally working project early and submit a more complete version later, that is just fine. I will grade the latest submission.

If, for some reason, you completely miss a project deadline, talk to me and we'll see what we can work out depending on the situation. Remember: partial credit is always WAY BETTER than no credit at all.

Grading & Assessment Overview
Your grade will be calculated based on the following:

- 5% Self-Intro Project
- 10% Text Battle Project
- 10% Text Adventure Project
- 15% ASCII Dungeon Project
- 5% Intro to SDL Project
- 20% 2D Dungeon Project
- 20% Quizzes & Graded Lesson Activities
- 15% Project Demos (x4)

* Note that if you are having trouble in the class, need an extension on a given assignment, or things outside of class are affecting your ability to do the work, talk with me about it sooner than later. In general, we can work something out.

Projects are graded on a combination of technical and creative competence.

Letter grades are assigned according to the following scale:

- A: 90% - 100%
- B: 80% - 89%
- C: 70% - 79%
- D: 60% - 69%
- F: 0% - 59%

Academic Integrity
Students must be responsible for their own work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be a foundation of our university culture. See: http://oai.gmu.edu/
Honor Code
Students must adhere to the guidelines of the George Mason University Honor Code. See: https://oai.gmu.edu/mason-honor-code/full-honor-code-document/

MasonLive/Email (GMU Email)
Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account. See: http://masonlive.gmu.edu/

Patriot Pass
Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Blackboard, University Libraries, myMason, Patriot Web, Wireless, and the Virtual Computing Lab. See: https://password.gmu.edu/index.jsp

University Policies
Students must follow the university policies. See: http://universitypolicy.gmu.edu/

Responsible Use of Computing
Students must follow the university policy for Responsible Use of Computing. See: http://universitypolicy.gmu.edu/policies/responsible-use-of-computing

University Calendar
Details regarding the current Academic Calendars. See: http://registrar.gmu.edu/calendars/index.html

Students with Disabilities
Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester. See: http://ods.gmu.edu/

Religious Holidays
A list of religious holidays is available on the University Life Calendar page. See: http://ulife.gmu.edu/calendar/religious-holiday-calendar/. Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 2 weeks in advance of the conflict date in order to make alternative arrangements.

Student Resources
University Libraries
University Libraries provides resources for online students. See: http://library.gmu.edu/distance
**Writing Center**

The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. See: [http://writingcenter.gmu.edu/](http://writingcenter.gmu.edu/). You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment!

**Counseling and Psychological Services**

The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. See: [http://caps.gmu.edu/](http://caps.gmu.edu/)

**Family Educational Rights and Privacy Act (FERPA)**

The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. See: [http://registrar.gmu.edu/privacy](http://registrar.gmu.edu/privacy)

**Course Schedule**

Please refer to the class Blackboard for the course schedule as well as important dates, such as assignment due dates, exam dates, and so on.