Online & Mobile Gaming
GAME232
TR 9:00–10:15 am (001) 10:30–11:45 am (002)  
AB1018

Instructor:  Prof. Sang Nam
Associate Director, Computer Game Design

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Office:  A&D Building 2025
Phone:  703-993-3163/office
Twitter:  twitter.com/sangumc
Office Hours*:  TR 11:45 am – 1:30 pm

* Other times by appointment. The best way to reach me 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
Class covers the history, practice, and design of online and mobile games. Class will discuss the current state of the smartphone applications, and study the best practices to be successful in the applications market. Students will learn the development process for smartphone applications and develop original and innovative applications in a team-based environment.

COURSE OVERVIEW
In this course, you will explore the ever-expanding world of mobile, pervasive, and “big” games. You will use professional game design techniques to create playable mobile games that you can add to your game design portfolio. Using Unity 3D, you will learn the fundamentals of game design, apply competition and playfulness, implement game design elements by modifying game templates from various video game genres, and debug using iterative game design.

STUDENT LEARNING OBJECTIVES
Upon completion of this course, students will
• Be familiar with the process of simple casual game development using Unity 3D
• Analyze casual games to understand their gameplay mechanics
• Utilize game mechanics to create a simple game
• Deploy games for various mobile devices and markets
• Design and build a game in a team based environment
• Exercise project management skills

REQUIRED TEXTS
There’s no required text for this course. Necessary materials will be distributed via online if
However, there are recommended online texts from unity3d.com. Especially, students are recommended to read documentation from the URL below:


### REQUIRED SOFTWARE
Students will be required to have existing knowledge of the following software to the extent that they can efficiently develop games and game assets.

- Unity game engine V. 5.4: [http://www.unity3d.com](http://www.unity3d.com)
- Art asset creating software such as Adobe Photoshop and/or Illustrator.
- Sound design/creation software such as Audacity or ProTools.
- Writing and presentation software such as that found in MS Office (Word, Powerpoint, Excel, etc.) or on Google Drive.

### CLASS POLICIES
Cell phones must be turned off or turned to “silent” mode.
Please do not text during class.

### ATTENDANCE
Attendance will be taken daily. The basic expectation for this discussion-based class is that **all students will attend every class** (once they are enrolled). You are, however, permitted **one** absence.

Beyond the one ‘free’ absence, only absences documented by a certified notice of athletic travel, medical illness, religious observance, or death or serious illness of a close family member qualifies as ‘excused’ absences. There are 29 total class days this semester, which means that each one missed represents a loss of 3.9% of the course. Unexcused absences therefore will result in deductions from your final grade as follows:

- 2nd unexcused absence = 2.5% deduction
- 3rd unexcused absence = 5% deduction
- 4th unexcused absence = 7.5% deduction

**Five or more unexcused absences will result in failure of the course**

### EXCUSED ABSENCES
Students have the right to miss class for religious observances. Students wishing for time off for this reason should let the instructor know within the first two weeks of class. Sometimes absences from class are unavoidable because of illness. Emergencies, other than illness, could cause absence from class. In these cases, students are expected to meet with the instructor as soon as possible after the crisis has passed and arrange to make up any missed work. However, a written document that proves your absence was unavoidable must be submitted, and the instructor reserves the right to determine whether or not to excuse such an absence.

### COMMUNICATION
If students need to contact the instructor outside of regular class time or office hours, email is the best way to do so. Due to Federal Privacy Laws (FERPA), instructor can only respond to messages
send from student’s Masonlive.gmu.edu email account. As a professional, student is expected to follow email etiquette – please, use complete sentences, spell check, and good grammar. If an email contains profanity or threats, it will be reported to the appropriate office on campus. If an email is written poorly, unclearly, or in test speak (e.g. what do U think I can do 2 get a btr grd lol”) will either be ignored or returned for revision. Student’s email will be responded promptly (usually within 1-2 weekdays).

If something comes up that affects student’s ability to attend/participate in class, it is important that student notifies instructor as soon as possible. Retroactive consideration will not be given to requests for exceptions, extensions, excused absences, etc. Similarly, if student is having trouble with something in the course, come and talk to instructor immediately.

**ACADEMIC HONESTY**
For complete information about the University’s policies on academic honesty, please see: http://www.gmu.edu/cte/Teaching/Getting_Started/Designing_Syllabus/academic_honesty.html

**GMU HONOR CODE**
http://www.gmu.edu/catalog/apolicies/index.html#Anchor12
Honor Code: To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

**ADDITIONAL RESOURCES**
GMU Student information and resources: http://www.gmu.edu/mlstudents/.

There will be a good amount of writing expected throughout the class. Please make use of GMU’s Writing Center (http://writingcenter.gmu.edu) if you feel you are struggling.

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 703-993-2474. All academic accommodations must be arranged through that office. Students must inform the instructor at the beginning of the semester, and the specific accommodation will be arranged through the Disability Resource Center.

**DISCLAIMER**
In this class, I reserve the right to show a broad range of course materials, some of which assume the audience to be adult in age and demeanor. Should you at any time in the course of the class feel offended by something you have seen or heard, we would appreciate you staying to be part of a dialogue. If you feel that you cannot stay, remove yourself from the classroom as discretely as possible. You may be asked to report on your response.

**COPYRIGHT IN UNIVERSITY WORK**
Students generally hold copyright in works that they create as students, such as papers, theses, dissertations, software code, or artistic or musical works. However, the instructor of this course will share the copyright of the work generated in this course when students develop and design a game/app using the source code and the guidance provided by the instructor.

**PRIVACY**
Students must use their MasonLIVE email account to receive important University information, including messages related to this class. See http://masonlive.gmu.edu for more information.
GRADING & ASSESSMENT OVERVIEW

Course work will include:

Assignment 1: Student Survey & Self-Introduction 5%
Assignment 2: Customizing Pong Using Unity 10%
Assignment 3: Breakout 2016 (Group Project) 10%
Assignment 4: Nolan Bushnell Paper & Lecture Reflection 10%
Assignment 5: Simple Game for Public Good (Group Project) 10%
Assignment 6: Simple Catch Game 10%
Assignment 7: Simple Space Shooter Game (Group Project) 10%

Final Project: 2D Game Prototype for Funding 30%
Participation (Class Critique & other class activities) 5%

* 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. In all likelihood, we can work something out.

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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.
GAME232 - Tentative Schedule

Week 01 (08/29) Introduction to the Course

08/30 Class #01

Course Introduction
Introduction to Unity Software
Installing Unity5 & Unity5 Basics
Unity Basics – Interface & Essentials (https://unity3d.com/learn/tutorials/topics/interface-essentials)
Unity Basics – Sample Assets
Power of Association (for student introduction)

09/01 Class #02

Assignment 1: Student Survey & Self-Introduction

* First day of classes – Mon 08/29/16

Week 02 (09/05) Unity Basics & Your Very First Game Using Unity

09/06 Class #03

Unity Basics (https://unity3d.com/learn)
The First Video Game (https://www.bnl.gov/about/history/firstvideo.php)
Recreating “The First Video Game” – How???
Reverse Engineering in Development

09/08 Class #04

Recreating “The First Video Game” Demonstration
1) Paddle movement: rigidbody & script
2) Ball movement: rigidbody & script
3) Interaction between game objects: collider & collision detection
4) Putting the ball back to the center: Transform.position (https://docs.unity3d.com/ScriptReference/Transform-position.html)

* Labor Day (University closed) – Mon 09/05/16
* Last Day to Add – Tues 09/06/16

Week 03 (09/12) Nolan Bushnell, Atari, & Pong

09/13 Class #05

Atari & Start-up Culture
Nolan Bushnell as Video Game Pioneer
Pong
Recreating “Pong”
Reverse Engineering: What do we already know & What do we need to learn?

09/15 Class #06

Recreating "Pong" Demonstration
1) Paddle movement: rigidbody & script
2) Ball movement: rigidbody & script
3) Interaction among game objects
4) Scoring System & GUI
5) Unity Web Player

Assignment 2: Customizing Pong Using Unity

**Week 04 (09/19) Jobs + Atari = Breakout**

09/20 Class #07

Jobs + Atari = Breakout
"Woz" way: Reverse Engineering in Development
Recreating "Breakout" from "Pong"
1) Paddle movement
2) Ball movement
3) Interaction among game objects
4) Delay with Invoke
5) Scoring System & GUI

Assignment 3: Breakout 2016 (Group Project)

09/22 Class #08

Recreating "Breakout" from "Pong" (Cont’d)
6) Level Design w/ Prefab & Instantiate
7) Restart w/ Application.LoadLevel (SceneManager.LoadScene)

**Week 05 (09/26) Exporting to Mobile Device**

09/27 Class #09

Unity Manual: Platform-Specific ([https://docs.unity3d.com/Manual/PlatformSpecific.html](https://docs.unity3d.com/Manual/PlatformSpecific.html))
Exporting “Breakout” to Mobile Device
1) Android Setting
2) From Keyboard to Fingertip (Mouse control)
   Mobile & Touch from Unity Tutorials ([https://unity3d.com/learn/tutorials/topics/mobile-touch](https://unity3d.com/learn/tutorials/topics/mobile-touch))
3) Screen.orientation ([https://docs.unity3d.com/ScriptReference/Screen-orientation.html](https://docs.unity3d.com/ScriptReference/Screen-orientation.html))
4) Dimension & Dynamic positioning/sizing
5) Adding BGM

09/29 Class #10

What does it take to produce a casual game?
Creative Skillsets in Games
([http://creativeskillset.org/search/59?tags%5B%5D=Games&tags%5B%5D=&tags%5B%5D= &q=](http://creativeskillset.org/search/59?tags%5B%5D=Games&tags%5B%5D=&tags%5B%5D= &q=))
Project Manager/Producer, Games Artist, Game Programmer, Audio Engineer
Working w/ deadline: Under-promise and over-deliver
[https://crew.co/backstage/blog/why-you-should-always-under-promise-and-over-deliver/](https://crew.co/backstage/blog/why-you-should-always-under-promise-and-over-deliver/)

Assignment 4: Nolan Bushnell Paper & Lecture Reflection
Week 06 (10/03) Game As An Agent For Social Change

10/04  Class #11

Jane McGonigal: Gaming can make a better world
(https://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world)

Serious Game? What is it?
SPENT (http://playspent.org/)
Simple Game for Public Good

10/06  Class #12

Breakout 2016 Presentation
* We will vote for the best game(s) and put it on Google Play & AppStore

Art/Game as an agent for social change

* 10/03 Lecture by Nolan Bushnell

Week 07 (10/10) Simple Text-based Game

10/11  No class: Mon classes meet instead of Tues classes this day only

10/13  Class #13

Simple Text-based Game (with “simple” image, button, and sound)
1) Immediate Mode GUI (IMGUI)
   (https://docs.unity3d.com/Manual/GUIScriptingGuide.html)
2) GUI vs. User Interface (UI)
   User Interface (https://unity3d.com/learn/tutorials/topics/user-interface-ui)

Assignment 5: Simple Game for Public Good (Group Project)

* Columbus Day Recess - Mon 10/10/16

Week 08 (10/17) Studio Day & Simple Catch Game

10/18  Class #14

Studio Day (Simple Game for Public Good)

10/20  Class #15 (online)

Simple Catch Game for Mobile
1) Reverse Engineering Re-visited: What do we know & what do we need to learn?
2) Mouse Control
3) Instantiating the Falling Objects
4) Scoring System
5) Varying Difficulties
6) Restart Button & High Score

Assignment 6: Simple Catch Game
* Mid-term evaluation period for full-semester 100-200 level classes – Mon 09/26/16 ~ Fri 10/21/16

**Week 09 (10/24) Mobile Development**

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<th>Topic</th>
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| 10/25 | Class #16 (online) | Exporting to both Android & iOS  
Platform-Specific: iOS (https://docs.unity3d.com/Manual/iphone.html)  
Mobile Developer Checklist (https://docs.unity3d.com/Manual/MobileDeveloperChecklist.html) |
| 10/27 | Class #17 | Recording Game Play  
Creating Game Demo  
Online Presentation of Simple Catch Game |

**Week 10 (10/31) Space Shooter Game**

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<th>Topic</th>
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<tr>
<td>11/01</td>
<td>Class #18</td>
<td>Simple Game for Public Good Presentation</td>
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| 11/03 | Class #19 | Recreating Space Shooter Game  
1) Movement (Keyboard & Mouse)  
2) Simple animation  
3) Prefab & Instantiate  
4) Randomization  
5) Scoring system  
6) Loading title, main, credit scenes separately |

Assignment 7: Simple Space Shooter Game (Group Project)

**Week 11 (11/07) Funding For Your Game**

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<th>Date</th>
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<th>Topic</th>
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| 11/09 | Class #20 | Funding You Game: Crowdfunding  
KICKSTARTER & INDIEGOGO  
Ex. Games on INDIEGOGO (https://www.indiegogo.com/search#/?q=game)  
Getting Your Kickstarter Funded: The 4 Elements Of A Successful Project (http://www.forbes.com/sites/theyec/2015/01/05/getting-your-kickstarter-funded-the-4-elements-of-a-successful-project/#6736700e39fd) |
| 11/11 | Class #21 | |

11/11
Simple Space Shooter Game Presentation

**Week 12 (11/14) 2D Platformer Game**

11/15 Class #22

2D Platformer Game
1) Basic Movement
2) Animation
3) Bullet
4) Enemy AI & Prefab
5) Bullet & Enemy Interaction
6) Teleport & Level Design

Final Project: 2D Game Prototype for Funding

11/17 Class #23

2D Platformer Game (cont’d) & 2D Roguelike Game

**Week 13 (11/21) – Thanksgiving Week**

11/22 Class #24

How to get your business funded
Prototyping – how much is enough?

11/24 No class

* Thanksgiving (No classes Wed; Recess Thurs – Sun) – Wed 11/23/16 ~ Sun 11/27/16

**Week 14 (11/28) More 2D Casual Games**

11/29 Class #25

2D Roguelike Game (cont’d)

12/01 Class #26

2D UFO Game

**Week 15 (12/05) Multiplayer Networking**

12/06 Class #27
Multiplayer Networking

12/08 Class #28: Last Day of Class
Student Evaluation

* Last Day of Class – Sat 12/10/16
Week 16 (12/12) Final Week

* Reading Day – Mon 12/10/16
* Final Examination Period – Tues 12/13/16 ~ Tues 12/20/16