GDD 314: VR/AR Development for Games

COURSE INFO

GDD 314
Fall 2023
Monday - Wednesday, 12:00 pm - 1:15 pm
TH129
http://mywebspace.quinnipiac.edu/jbwarren/314

INSTRUCTOR INFO

Jonah Warren
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203.582.7921
CAS 1 339

OFFICE HOURS

My office hours are:
Tuesday, 10:00 AM - 12:30 PM

All other times by appointment. I'm available via email during the week (Monday-Friday) and will try to respond to emails within 48 hours. Emails received on the weekend will be responded to by the beginning of the following week.

DESCRIPTION

This course is an exploration into the potentials of augmented and virtual reality in play and games. Students will learn the skills to design and develop virtual reality applications for dedicated headsets and augmented reality applications for smartphones in Unity.

LEARNING OUTCOMES

Students in GDD 314 will:
- Learn about the history of augmented and virtual reality;
- investigate the unique affordances and constraints of each technology;
- examine the current landscape of augmented reality and virtual reality applications;
- learn how to develop virtual reality applications in Unity;
- learn how to develop augmented reality applications in Unity;
- futher explore XR through a self-directed final project.

STRUCTURE

The semester will be divided into three parts. The first third of the semester students will research existing VR applications, learn how to develop applications for VR headsets, and complete two small prototypes. The second third of the semester will follow a similar structure but for AR applications: research the current state of AR, learn the tools for creating applications, and complete two prototypes. During the last third of the semester, students will form small teams and continue development on a prototype of their choice, turning it into a fully functional application.

PHILOSOPHY

Video games and new technologies are often thought to go hand in hand. Unfortunately, more often than not, new technologies in games are shoehorned into existing genres or paradigms rather than being explored on their own terms. This course encourages students to do the opposite — to explore XR technologies

with an open mind, letting the exploration of the possibility space lead the design process.

WEBSITES

Our class website is:
http://mywebspace.quinnipiac.edu/jbwarren/314

A shortcut to the site is: http://bit.ly/gdd-314. Students must post assignments to their website on mywebspace. Please create a folder for the class named 314.

EQUIPMENT

During the course of the semester, you may be loaned equipment to use (e.g., VR headsets, cables, controllers). Please be careful with it. It is expected that all loaned equipment be returned (including all cables, chargers, controllers, boxes) in the same condition as when it was issued. If equipment is lost or damaged a hold may be placed with the bursar until you reimburse the department for the cost of the lost or damaged items.

SOFTWARE

We will be using Unity to create VR and AR applications. If you'd like to use Unreal or some other engine, that should be fine, but please let me know. You can find Unity here: http://unity3d.com/unity/download. You may also complete coursework working in the lab. Each workstation in the GDD Lab has all the software needed to complete required assignments.

GDD STORAGE

GDD is a program in which you will be generating a great deal of digital content. Safe storage of this material is essential to your success in the GDD program. We recommend using One Drive accessible through your Outlook email account, but it is essential that you also have your own external drive in which you keep current and backup files for all of your work. Do not leave materials on the hard drives of the machines in the lab as these machines can crash or have the drives wiped unpredictably. As professionals in this field we expect you to understand that lost or damaged files are not an excuse for missing or late work. Backup your work and archive it regularly.

STUDENT WORK

GDD keeps an archive of student work which may be displayed on the program website and used to publicize and promote our students and our program. At the end of each semester, you are responsible for turning in your completed projects with all associated code and media, to your professor. For your final project, you should also turn in a video of gameplay. Make sure all media is accurately credited. You should also have a website that GDD will link to from the student page of the GDD site that provides links to your bio and completed projects.

LAB RULES

No eating in the lab. No cellphone use during class time. No working on projects, browsing the web or watching YouTube while other students are making presentations or during class discussions. This is extremely disrespectful towards your classmates and will negatively impact your grade.

SCHEDULE

WEEK 1 – Intros, Course structure
WEEK 2 – Introduction to VR, Readings, Looking outward presentations
WEEK 3 – VR Unity set up, Devices, Development environment overview
WEEK 4 – Grabbing, Raycasting
WEEK 5 – Locomotion

WEEK 6 – UI inVR
WEEK 7 – Introduction to AR, Readings, Looking outward presentations
WEEK 8 – AR Unity set up, Devices, Development environment overview
WEEK 9 – Plane detection, Hit testing
WEEK 10 – Image tracking, Face tracking
WEEK 11 – UI in AR
WEEK 12 – Final Project: Proposals
WEEK 13 – Main Project: Playtest and Iterate
WEEK 14 – Main Project: Playtest and Iterate
FINAL EXAM – Main Project: Final Presentations

FINAL

We will meet during the scheduled exam period for final project presentations. Attendance is required, so make your travel plans accordingly.

GRADE BREAKDOWN

Your total grade will be be calculated according to the following breakdown:

110 VR Affordances Research and App Presentation
120 VR | Project 1
120 VR | Project 2
110 AR Affordances Research and App Presentation
120 AR | Project 1
~~120 AR | Project 2~~
200 Final
100 Professionalism

If you do not show up for your final presentation without notifying me prior, you will fail the final project.

GRADING RUBRIC

Each grade you get will be broken down into categories. Each of those categories will be evaluated using the following metrics: Exceeds Expectations (100%), Meets Expectations (80%), Approaches Expectations (60%), Does Not Meet Expectations (40%), or Not Attempted (0%). The rubric for each assignment can be found on Blackboard. Here's an example rubric for project grades.

	Does Not Meet Expectations (40%)	Approaches Expectations (65%)	Meets Expectations (85%)	Exceeds Expectations (100%)
Creativity (20%)	Feels like a copy of an existing game.	Close to an existing game. Potentially entails small alterations that aren't meaningfully significant.	Combining existing ideas effectively. Feels like its own experience.	Unique and different. Combining ideas in new and interesting ways, resulting in unanticipated opportunities.
Technology (20%)	No consideration of the technology. Potentially better suited for a different platform.	Could do a better job working with affordances and considering constraints.	The experience is designed so that it takes advantage of the technology's unique opportunities.	Very smart, thoughtful use of affordances and constraints. Could only exist on this platform.

Experience (40%)	A repetitive, tedious, or unintentionally confusing experience.	Has moments which keep the player's attention, but fails to do so for an extended period of time. Possible usability, level design, and/or progression issues.	A nicely designed, engaging experience. The player is incentivized to continue playing. Good in-game player feedback.	Provides a very engaging experience through thoughtful, well-designed gameplay and feedback. Keeps the player's attention by providing increasingly interesting challenges and/or choices.
Professionalism (20%)	Hastily-made, sloppy work.	Looking for more attention and care. Inconsistent and unprofessional.	Good attention to detail. No cut off UI, blurry text, or sloppy, uncommented code.	Exceptional attention to detail. All screens are well-designed, code is well-written and commented, and its design consistent and considered.

Here is an example assignment grade, worth 70pts:

Creativity (20%)	×	Meets Expectations (85%)	× 70 =	11.9pts
Technology (20%)	×	Exceeds Expectations (100%)	× 70 =	14pts
Experience (40%)	×	Meets Expectations (85%)	× 70 =	23.8pts
Professionalism (20%)	×	Exceeds Expectations (100%)	× 70 =	14pts

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63.7pts (91%)

*Professionalism Grades:
Your professionalism grade will use the Quinnipiac Grading Scale below and be based on your conduct in class, attendance, punctuality, participation, general engagement, respect for the learning environment and respect for your classmates and your teammates. If do not contribute, watch YouTube videos during critique, or are regularly disrespectful of your teammates do not expect a passing grade. You will lose two points from this grade if you have your phone out during class discussion.

CHECKING GRADES

It is your responsibility to keep track of your grades throughout the semester. Grades will be posted on Blackboard and may be checked at any time. If you are not doing as well as you would like to be, you can meet with me to discuss extra credit projects BEFORE the semester ends. If you feel that I have made a mistake recording a grade or failed to enter a grade that you earned correctly, please email me so that I can correct it. Do not contact me just because you want a higher grade on a graded assignment.

GRADING SCALE

Your final letter grade is based on the Quinnipiac Grading Scale as follows:

A 93–100	B+ 87–89	B- 80–82	C 73–76	D 60–69
A- 90–92	B 83–86	C+ 77–79	C- 70–72	F 0–59

NOTE: A grade of C- or better is required in all game design and development

courses and prerequisites. Students with a GPA of less than 2.0 will be put on probation. After two semesters on probation, students will be advised to change majors.

PLAGIARISM

All the work you do for class must be your own unless you cite it. Clearly provide links to any code, art, music, or sound you use to complete assignments. This is especially important regarding the use of tutorials and using other people's code. If you use a tutorial from the web that includes code, I expect you to be able to explain how each line of code works, notify me that you are using a tutorial, and provide a link to that tutorial. If you fail to cite your sources, it will be assumed that you are trying to pass off the work as your own and it will be considered plagiarism. This will result in a zero on the assignment, notifying the Academic Integrity Board and a permanent record in your file. See below for more information about Quinnipiac's Academic Integrity policy.

ACADEMIC INTEGRITY

At Quinnipiac, our community has chosen integrity as one of its guiding principles. Our academic integrity policy is based on the five fundamental values outlined by the Center for Academic Integrity: honesty, trust, responsibility, fairness and respect. "Double Dipping" (Multiple Uses of the Same Work) or presenting the same or substantially the same written work (or portion thereof) as part of the course requirement for more than one project or course, requires the express prior written permission of the instructor(s) involved. Any violation will be dealt with according to the Integrity policy, which can be found at:

https://myq.quinnipiac.edu/Academics/Academic%20Integrity/Pages/default.aspx

STUDENT HANDBOOK

The Quinnipiac University Student Handbook is intended to serve as a source of information on the many services, activities and policies of Quinnipiac. The handbook can be found at:

http://www.quinnipiac.edu/student-experience/health-and-safety/student-handbook/

VPA ABSENCE POLICY

You are expected to be in class ready to work at the beginning of the scheduled class time. PROMPT ARRIVAL TO CLASS IS EXPECTED. Three late arrivals to class will equal one absence. PLEASE NOTE: IF YOU HAVE 6 OR MORE ABSENCES YOU MAY BE ASKED TO WITHDRAW FROM THE COURSE. 7 ABSENCES DURING THE SEMESTER WILL RESULT IN A FAILING GRADE. Attendance for the last class meeting scheduled during Finals Week is required. In the case of extenuating circumstances, such as an ongoing illness or the death of a loved one, the professor should be consulted as soon as possible, and documentation from the Student Affairs office may be required. In such circumstances the faculty and student can negotiate the possibility of granting an "Incomplete." In the rare cases where a student is allowed to take an "Incomplete" as the result of extenuating circumstances, the student must follow the guidelines and timelines stipulated in the University catalog.

LATE WORK POLICY

The assignments for this class must be turned in complete and on-time. If you have a medical or family emergency which will prevent you from getting your work done, it is your obligation to notify the professor of this fact and provide

him/her with the appropriate documentation BEFORE the due date of the assignment. If your work is not turned in on time and you have not provided an excuse prior to the due date, do NOT email the professor with justifications. You will simply not receive credit for the assignment.

INCLUSION STATEMENT GDD is committed to maintaining an environment in which all members are treated equitably, feel fairly represented, and are comfortable discussing topics, particularly controversial ones, with civility and open-mindedness. We are working to build a community of diverse individuals who can celebrate our differences while building on what we have in common. Game design is a creative practice, so we encourage wide-ranging explorations of what is possible while respecting practices that work toward the greater good. We ask all members of the community to think about the work they are producing and ask themselves if they are consciously or unconsciously reproducing or reinforcing stereotypes, bias, or other elements that reinforce systemic racism, sexism, bigotry or other inequalities. Games can change the world; let's make sure we are changing it in a positive way.

POLICY ON DISABILITIES QU is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me.

If you have a disability, or think you may have a disability, you may also want to meet with the Office of Student Accessibility to begin this conversation or to request reasonable accommodations. Quinnipiac University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. Please contact the Office of Student Accessibility by emailing access@qu.edu, or by calling (203) 582 – 7600.

If you have already been approved for accommodations through the Office of Student Accessibility, please have a discussion with me so that so we can develop an implementation plan together.

LEARNING COMMONS The Learning Commons is a place for students to go when they want to achieve a level of performance they can't reach on their own. In a setting of practice and growth, student resources are provided through Peer Educator programs, the Office of Student Accessibility, and Academic Development & Outreach professional staff. The Learning Commons can be found at the Mount Carmel Campus in the North wing of the Arnold Bernhard Library; and at the North Haven Campus on the third floor of the Law School (SLE-340). Students are encouraged to visit The Learning Commons for support with class content, to improve study skills, to consult on academic success strategies, and for general developmental advising needs.

Phone: 203-582-8628
Email: LearningCommons@Quinnipiac.edu
Website: https://www.qu.edu/student-resources/academic-support.html