Hyo Kang
Contact: Canvas Email
Office: Room 116, Norman Hall
Hours: Wed 10 AM to 12 PM

DIG4540 Production of Immersive Environments

Fall 2022

Course Meetings:	M | Period 8 - 9 (3:00 PM - 4:55 PM) W | Period 9 (4:05 PM - 4:55 PM)
Course Modality:	Face to Face
Course Location:	NRG 0207, Norman Gym

Course Description

This course will provide an overview of the principles of virtual reality (VR) technology. The course has a strong focus on VR development, so students should be familiar with Unity and C# programming. The course will be comprised of instructor lectures and a Unity tutorial where students will learn about the basics of scripting and rendering virtual environments. The topics include object-oriented programming, collision detection, animation control, and editing virtual scenes. Students will be able to interact directly with immersive virtual environment technology and gain first-hand experience. As a final project, students will create an interactive VR game utilizing various concepts covered in the class. The class will be technologically motivated. Students should be comfortable learning new software.

Course Prerequisites

DIG3305C and DIG3878 with minimum grade of C.

Learning Outcomes

By the end of semester, students will be able to

- Understand the principles of virtual reality technology.
- Understand the recent trends and identify potential applications of VR in multiple domains including education, healthcare, and training.
- Acquire technical knowledge and skillsets to create a VR environment.
- Develop an interactive VR environment using Oculus Quest headsets.

Materials & Books

Technology Requirements

- **Unity:** https://unity3d.com/get-unity/download
- **Visual Studio:** https://visualstudio.microsoft.com/downloads/
- **Oculus:** https://www.oculus.com/rift/setup/

Course Schedule

This schedule is only a guide and is subject to change. Unless otherwise indicated, assignments and readings are due the day they are listed on the syllabus, not the following day.

Week	Subject	Assignments
Week 1	**Introduction** • Course Introduction	**Practice Exercise**
Week 2	**What is Immersive Media** • Definition and History of Virtual Reality • Application of Virtual Reality	
Week 3	**3D Interaction Design** • Interaction Techniques in VR • Navigation and Manipulation	**Project pitch (Individual)**
Week 4	**C# Basics** • C#: Variable, Function, Condition • Function: Start, Update, Fixed Update	Exercise 1: Moving a Game Object
Week 5	**Unity Basics: Moving a 3D Object in Unity** • Transform • Rigidbody	**Quiz 1** Exercise 2: Shooting Game
Week 6	**Setting up VR Devices** • Three Components • XR Plugin	Exercise 3: VR Sports Game
Week 7	**Creating an Interactive Environment** • Trigger and Collision • Audio Source	Exercise 4: VR Beat Saber
Week 8	**Group Project: Wireframe and Scene Development** • Collaborating in Unity: Plastic SCM	**Quiz 2** **Group Project1. Scene Development**
Week 9	**Character Animation in Unity** • Animation, Animator • Scripting for Animation Control	Exercise 5: Zombie Attack
Week 10	**Build a VR game Part 1** • Unity UI • Interaction: Following Enemy	Exercise 6: Haunted House Part 1
Week 11	**Build a VR game Part 2** • Array and List • IEnumerator and Start Coroutine	Exercise 7. Haunted House Part 2
Week 12	**Group Project2. VR Interaction** • Project Portfolio Development	**Quiz 3** **Group Project 2. VR Interaction**
Week 13	**Build a VR game Part 2** • Input System • Velocity Tracking	Exercise8. Haunted House Part 3
Week 14	**Graphics in Unity** • Unity Shader • Shader Language: GSLS	
Week 15	Project time	**Quiz 4**
Week 16	**Group Project Final Presentation**	**Project Demo**

Grading Criteria

Assignment	Sub Point	% of Grade
Participation and attendance: Students are expected to actively participate in class discussions. For attendance policies, please see the course policies in page 4.		5
Quizzes: There will be 4 quizzes throughout the semester. The students will be tested on the materials covered during the lecture time		25
Exercises: Unity exercises will be assigned during class and due on Sunday midnight. Each exercise will be graded according to the following criteria: (1) fulfillment of basic requirements, and (2) appropriate use of techniques, and (3) quality of works..		35
Exercise 1. Moving a Game Object	2	
Exercise 2. Shooting Game	3	
Exercise 3. VR Sports Game (VR submission: pair work)	5	
Exercise 4. VR Beat Saber (VR submission: pair work)	5	
Exercise 5. Zombie Attack	5	
Exercise 6. Haunted House Part 1	5	
Exercise 7. Haunted House Part 2	5	
Exercise 8. Haunted House Part 3 (VR submission: pair work)	5	
Project Idea Pitch: Student will pitch their project ideas and share them with classmates. Students will prepare 5 min presentation, describing a topic they are interested and goals for the final project.		5
Group Project: Students will conduct a semester-long group project to develop a virtual reality application. The final group project will be evaluated by quality, creativity, and mechanics of the VR applications.		30
Group Project 1. Wireframe and Scene Development	5	
Group Project 2. VR Interaction	5	
Final Group Project	10	
Video Demo	5	
Peer Evaluation (Group Project Contribution)	5	
TOTAL		**100**

Late Submission Policy

All course works must be submitted no later than the due date unless prior arrangements are made with the instructor. If a student submits an assignment late without making prior arrangements, **1 point** will be deducted each day**.** To request a deadline extension, please contact an instructor **48 hours** before the due date.

THIS DOES NOT APPLY TO GROUP PROJECT. All group projects should be submitted by due dates.

Grading Scale

Letter Grade	% Equivalency
A	94 – 100%
A-	90 – 93%
B+	87 – 89%
B	84 – 86%
B-	80 – 83%
C+	77 – 79%
C	74 – 76%
C-	70 – 73%
D+	67 – 69%
D	64 – 66%
D-	60 – 63%
E, I, NG, S-U, WF	0 – 59%

More information on grades and grading policies is here: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Materials and Supply Fees
Material and supply and equipment use fee information is available from the academic departments or from the schedule of courses (Florida Statutes 1009.24). The total course fee for this class is $0.00.

The total course fee for each course is listed on the UF Schedule of Courses. (https://registrar.ufl.edu/soc/).

Course Policy

Attendance Policy

Attendance is mandatory and students are responsible for keeping track of their own attendance.

Students are required to attend the class on time to receive full credits for attendance. During the semester students are allowed 3 absences. **Any absence beyond these will result in a lowering of their grade by one letter grade for each missed class.** For example, A will go to A-, B will go to B-, and C+ to C-. If students feel at any point that more than 3 absences from the class will be unavoidable, arrange to meet with the instructor or academic advisor to discuss how this should be dealt with. It is students' responsibility to catch up on any assignments or homework that they have missed during their absence.

In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, and participation in official university activities such as music performances, athletic competition, or debate. Students must provide **appropriate documentation in advance of the absence when possible.** No documentation is needed for an absence due to religious observation.

Requirements for class attendance and missing assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Late Submission

All course works must be submitted no later than the due date unless prior arrangements are made with the instructor. If a student submits an assignment after the due date without making arrangements with the instructor, **1 point** will be deducted each day.

Extension: To request a deadline extension, please make sure to contact the instructor **48 hours** before the due date. Failure to abide by this rule will result in a point deduction for your assignments. This **DOES NOT APPLY TO THE GROUP PROJECTS.** All groups need to present and submit their work by the due date.

Missing Quizzes

There is **NO MAKE UP QUIZ**, if students miss a quiz without making prior arrangement. Please contact an instructor **a week** advance to reschedule your quiz. The acceptable reasons for rescheduling a quiz include illness, special curricular requirements (e.g., professional conferences), military obligation, religious holidays, and participation in official university activities such as music performances, athletic competition, or debate. Students must provide **appropriate documentation in advance of the absence when possible.**

Course Modality

Face to Face: Students are expected to attend the class in person. Class sessions may be recorded for students to view later per request. Please allow 1-2 weeks for the course recording uploaded on Canvas.

Creation of Original Content Ethics

For original projects and all assignment deliverables, students should remember that representations of acts of violence, coarse and offensive language, sexual behavior, bodily function and ability, neurodiversity, and personal identity are likely to cause extreme audience response, regardless of the creator's intentions. In addition, the recreation of such actions and subjects for fictional purposes may unintentionally traumatize or negatively impact those who collaborate in the creation of the images. While the university encourages students to explore themes and tell stories that may include this difficult subject matter, they should be cautioned against modes or styles of representation that might be considered unnecessarily offensive or potentially triggering. Instructors, faculty, and university administrators reserve the right to not show or share any student work they feel is inappropriate for their classroom or for public exhibition, as there may be concerns about the impact of such work on the community. We encourage students to consult with their faculty when producing work that might be considered controversial, and to err on the side of being cautious when it comes to making decisions about a project's content - in other words, make the PG-13 version of your story, not the R version, and certainly not the "unrated" version. This is also to help students understand that most professional creative situations have strict guidelines and limitations on such content and how it is produced: your ability to tell stories effectively with "less" is a strong professional skill that will aid in the dissemination of your work to a broader audience

Course Technology Center

The Technology Support Center provides computer support for Digital Worlds students who access Zoom, lecture recordings, student equipment, facilities and other technology-based resources.

http://digitalworlds.ufl.edu/support

For computer assistance related to Zoon, lecture recordings, student equipment, and facilities request please Submit a Help Ticket or email support@digitalworlds.ufl.edu.

For support related to account services, technical consulting, mobile device services, software services, administrative support, application support center, and learning support services, please contact the UF Computing Help Desk available 24 hours a day, 7 days a week at 352-392-4357 or helpdesk@ufl.edu

University Policies

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Class Demeanor

Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Netiquette Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats, more information can be found at: http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://catalog.ufl.edu/UGRD/academic-regulations/ferpa-confidentiality-student-records/

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/