

DIG6126C Interaction Design

Fall 2024

Course Meetings: T | Period 4 (10:40 AM - 11:30 AM)
R | Period 4 - 5 (10:40 AM - 12:35 PM)

Course Modality: Face to Face

Course Description

This course will teach students the fundamental usability concept and methods for designing 3D user interfaces. Throughout the course, students will become equipped with the tools required to create an interactive virtual reality (VR) interface and learn design principles to enhance usability and user experience (UX) within VR environments. Students will learn to how to adopt a user-centered approach to 3D interaction design in virtual reality. The class will be technologically motivated. Students should be comfortable learning new software.

Course Prerequisites

Admission in MiDAS program or consent of instructor.

Learning Outcomes

By the end of semester, students will

- Understand the principles of 3D user interaction design.
- Understand research topics related to virtual reality, including the sense of presence, immersion, and embodiment within VR
- Achieve an understanding of the entire UX design cycle: user research, ideation, wireframing, prototyping, and evaluation.
- Acquire the technical knowledge and skillsets to create a VR interface, including scripting in C# and setting up XR interaction toolkits in Unity.
- Write a research paper on 3D user interaction design and human-computer interaction.
- Design a novel interface for interacting with objects in VR.

Materials & Books

Textbook (Optional)

- **Interaction Design: Beyond Human - Computer Interaction** 3rd Edition by Yvonne Rogers, Helen Sharp, and Jenny Preece ISBN-10 : 9780470665763 ISBN-13 : 978-0470665763

Technology Requirements

- **Unity :** <https://unity3d.com/get-unity/download>
- **Oculus:** <https://www.oculus.com/rift/setup/>

Course Schedule

This schedule is only a guide and is subject to change.

Part 1. Interaction Design Overview

Week	Subjects	Assignment
1	Course Introduction <ul style="list-style-type: none">• What is Interaction Design?	
2	What is Virtual Reality? <ul style="list-style-type: none">• Presence and Immersion• XR Set-up in Unity	Reading Discussion 1 Practice Unity Exercise
3	3D Interaction Design <ul style="list-style-type: none">• Interaction Design Overview• User Flow and Storyboard	Reading Discussion 2
4	Basic C# Programming <ul style="list-style-type: none">• Object, Class, Methods• Variable, Function, Condition	Reading Discussion 3 Project 1. Project Pitch and Storyboard
5	Collaboration in Unity <ul style="list-style-type: none">• Unity Version Control• XR Plug-in Management	Reading Discussion 4 Unity Exercise 1

Part 2. VR Development Basics

6	Unity: Moving 3D Objects <ul style="list-style-type: none">• Transform and Rigidbody• Vector Math	Unity Exercise 2
7	Unity: Collision and Unity UI <ul style="list-style-type: none">• Trigger and Collision• Unity UI	Quiz 1
8	Unity: Lighting and Shader <ul style="list-style-type: none">• Lighting, URP, HDRP• Shader Graphs	Group Project 2. Scene setup
9	Unity: Object Spawning <ul style="list-style-type: none">• Instantiate• Courtine	Unity Exercise 3
10	Unity: Animation <ul style="list-style-type: none">• Animation• Animator Control	Unity Exercise 4
11	Unity: XR Action-based Input <ul style="list-style-type: none">• XR Inputs• XR Shooting	Unity Exercise 5
12	Unity: SuperHot VR Game <ul style="list-style-type: none">• Nav Mesh• Time, TimeScale, DeltaTime	Quiz 2 Unity Exercise 6

Part 4. Evaluation and User Testing

13	Evaluation Method Overview <ul style="list-style-type: none">• Survey and Interview• Usability Testing	Group Project 3. Prototype
14	Data Analysis Method <ul style="list-style-type: none">• Qualitative Analysis	
15	Special Topic <ul style="list-style-type: none">• C# Event	
16	Group Project 5. Final Presentation	Group Project 4 & Final Report

Grading Criteria

Assignment	% of Grade
Attendance: Students are expected to attend the classes in-person and actively participate in class discussions. For attendance policies, please see the course policies in page 4.	5
Reading Discussion: Students will read the assigned materials, watch the related videos, and write a paragraph discussing their impressions. The readings will consist of ACM conference proceedings. Students should come to class prepared to discuss the assigned articles in depth.	10
Reading Presentation: Each student will present an assigned article during the course. Prepare 5 min presentation that includes information about research background, game design, and implications of the assigned article.	5
Quiz: There will be two quizzes throughout the semester. The quiz questions will primarily focus on the lecture materials, especially C# programming.	20
Unity Exercise: 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.	20
Unity Exercise 1. XR Setup	
Unity Exercise 2. Moving 3D Objects	
Unity Exercise 3. Object Spawning	
Unity Exercise 4. Nav Agent	
Unity Exercise 5. XR Action Based Input	
Unity Exercise 6. SuperHot VR	
Group Project: Students will work in a team to develop a VR application. Applying course materials, students will identify users' need, ideate design concepts, develop prototypes, and evaluate usability of the developed tools. The final design should be interactive, immersive, and user-friendly. Projects will be graded based on their creativity, usability, and functionality to accomplish the UX goals.	30
Project 1. Project Pitch and Storyboard	
Project 2. Unity Scene setup	
Project 3. Prototype	
Project 4. Final Presentation	
Peer Evaluation (Group Contribution)	
Final Paper (Group): The project team will write a research paper documenting their development and design process. The paper should follow the ACM extended abstract format, including sections on related work, game design, methods, and discussion. Additionally, the team will create a 3-minute gameplay video showcasing both the game screen and the player interacting with the game.	10
TOTAL	100

IMPORTANT COURSE 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 after the due date 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.

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.

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/>