



Dr. Angelos Barmpoutis

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Office: E109, CSE building

Hours: Mondays 11:45am-1:45pm

DIG6050 Entertainment Technology

Fall 2024

Course Meetings: Mondays 4th period & Wednesdays 4-5th periods

Course Modality: Face-to-Face (F2F) Live

Course Description

The goal of this class is to understand the core principles behind entertainment technology. Real-time simulation, physics engine development, and level construction will be covered in depth. Advanced concepts on game engine development will be discussed, building on the knowledge and skills acquired in other classes.

Course Prerequisites

Sufficient computer programming knowledge and fundamentals on game engine development. DIG6751C

Learning Outcomes

By the end of this course, students will be able to:

- Use in practice user experience design concepts.
- Learn the principles of simulation using game engines.
- Gain experience in immersive design.
- Create custom tangible interfaces for virtual and augmented reality.
- Develop environments for entertainment technology.

Materials & Books

Required

- A list of papers will be provided by the instructor.

Supplemental

- Kemper, L., Lam, J., Levine, M., Pifer, A., Seung, H., Santoso, M. and Barmpoutis, A., 2024. Assessing the Influence of Passive Haptics on User Perception of Physical Properties in Virtual Reality. In: Chen, J.Y.C., Fragomeni, G. (eds) Virtual, Augmented and Mixed Reality. HCII 2024. Lecture Notes in Computer Science (LNCS), vol. 14707, pp. 191-200.
- Garrett, R., Gast, J., Henry, S., Mellili, K., Seung, H., Santoso, M. and Barmpoutis, A., 2024. Investigating how interaction with physical objects within virtual environments affects knowledge acquisition and recall. In: Stephanidis, C., Antona, M., Ntoa, S., Salvendy, G. (eds) HCI International 2024 Posters. HCII 2024.

Communications in Computer and Information Science (CCIS), vol. 2116, pp. 33-40.

- Delgado, J., West, R., Marin, J., DaSilva, D., Barmpoutis, A., Jang, S., Stanley, E. and Kang, H., 2024. Enhancing Museum Experience with Virtual Reality: Situating 3D Museum Collections in Context. *Proceedings of the 23rd ACM Interaction Design and Children (IDC) Conference*, pp. 670-675.
- Barmpoutis, A., Guo, W. and Said, I., 2023. Developing Mini VR Game Engines as an Engaging Learning Method for Digital Arts & Sciences. *13th IEEE Integrated STEM Education Conference*, pp. 33-36.
- Barmpoutis, A., Faris, R., Garcia, S., Li, J., Philoctete, J., Puthusseril, J., Wood, L. and Zhang, M., 2020. Virtual Kayaking: A study on the effect of low-cost passive haptics on the user experience while exercising. *Proceedings of the 2020 HCI International Conference* C. Stephanidis and M. Antona (Eds.), Communications in Computer and Information Science series (CCIS), vol. 1225, pp. 147-155
- Barmpoutis, A., Faris, R., Garcia, L., Gruber, L., Li, J., Peralta, F. and Zhang, M., 2020. Assessing the Role of Virtual Reality with Passive Haptics in Music Conductor Education: A Pilot Study. In *Proceedings of the 2020 Human-Computer Interaction International Conference*, J. Y. C. Chen and G. Fragomeni (Eds.), LNCS, vol. 12190, pp. 275-285.
- Barmpoutis, A., Ding, Q., Anthony, L., Eugene, W. and Suvajdzic, M., 2016. Exploration of Kinesthetic Gaming for Enhancing Elementary Math Education using Culturally Responsive Teaching Methodologies. In *Proceedings of VR16 Workshops: IEEE Virtual Reality 2016 Workshop on K-12 Embodied Learning through Virtual & Augmented Reality (KELVAR)*, pp. 1-4
- Barmpoutis, A., DeVane, B. and Oliverio, J., 2014. Applications of Virtual Environments in Experiential, STEM, and Health Science Education. Chapter 41 In *Handbook of Virtual Environments: Design, Implementation, and Applications*, Second Edition, K. Hale and K. Stanney (ed.), CRC press, Taylor & Francis Group, pp. 1055-1071.

Technology Requirements

- Unity3D
- Computer to run Unity3D
- VR Headset

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	Assignment Quizzes	Assignments Due
Week 1	Introduction to Entertainment Technology History of video games and computer graphics.	Canvas Discussion	In class
Week 2	Use of haptics in Virtual and Augmented Reality Review of passive haptic research projects.	Project Proposals	In 1 week.
Week 3	Real-time Space and Body tracking 3D Transformations and linear algebra in computer graphics.	Programming Assignment	In class
Week 4	3D scanning cameras Computer representation of 3D objects and 3D file formats.	Programming Assignment	In class

Week 5	Head-mounted display technologies.	Quarter 1 Checkpoint	In 1 week.
Week 6	STEM applications of VR/AR Introduction to OpenXR and application in Meta headsets.	Canvas Discussion	In class
Week 7	User study practices and policies. Parametric animations and object trajectories.	Programming Assignment	In class
Week 8	Protocols for user experience studies	Canvas Discussion	In class
Week 9	Midterm Project Presentations	Midterm Checkpoint	In 1 week.
Week 10	Interaction design concepts I	Canvas Discussion	In class
Week 11	Interaction design concepts II	Canvas Discussion	In class
Week 12	Understanding the user needs	Quarter 3 Checkpoint	In 1 week.
Week 13	Measuring usability and ease of use	Canvas Discussion	In class
Week 14	Case study: VR applications in fitness	Canvas Discussion	In class
Week 15	Case study: VR applications in education	Canvas Discussion	In class
Week 16	Final Project Presentations	Final Project	In 1 week.

Grading Criteria

Assignment / Assessment	Total Points	% of Grade
Weekly Assignments and Project Reports – This includes weekly canvas discussions, or in-class programming assignments. Each student will also submit a weekly project report outlining the individual contributions and progress of the semester-long group project.	56	56%

Final Project – The students will work in groups in order to develop a semester-long project in a topic that will be selected in the beginning of the semester. The project will demonstrate the entertainment technology concepts covered throughout the semester.	30	30%
Attendance and Participation – The students are expected to actively participate in class activities.	14	14%

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 are 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 Policies

Attendance Policy, Class Expectations, and Make-Up Policy

The instructor is responsible for communicating the specific details of what percentage of your grade (if any) will be assigned to participation, and how class participation will be measured and graded. The UF Digital Worlds Institute is committed to the idea that regular student engagement is essential to successful scholastic achievement. No matter if the class is held in a traditional classroom, an online classroom, or a combination of the two, interaction with your peers and the instructor will empower you to greater achievement.

Attendance is mandatory in this class and will be taken daily. Students are allowed three unexcused absences. If you miss more than three classes during the semester, each additional absence will lower your overall grade by 100 points. If you miss more than six classes, you will fail the course. Exempt from this policy are only those absences involving university-sponsored events, such as athletics and band, and religious holidays, family emergencies, and health issues for which you must provide appropriate documentation in advance of the absence.

Additionally, tardiness will not be tolerated. If you are tardy for three class periods, you will receive an unexcused

absence.

Unless discussed at least 72 hours in advance of the deadline, late assignments will not be accepted. Excluded from this policy are any assignments missed due to medical emergencies.




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 make-up exams, 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/>

Course Modality

Course modality is the way in which a class is offered/delivered to students by the instructor. All students, regardless of the modality, will achieve the same learning objectives. Students can check their class schedules or reference the top of this syllabus to see the format(s) available for each of their individual classes. The modality of a course does not vary during a semester, and students are expected to adhere to the instructor-defined attendance guidelines for that format. Use the guide below to familiarize yourself with the various ways classes are offered at the Digital Worlds Institute.

Know Your Course Modality

		
Face-to-Face (F2F)	Online Asynchronous (OA)	Online Synchronous (OS)
Students attend class F2F in a classroom. Class sessions may be recorded for students to view later.	Students watch the posted recording of the class session or studio recording online at their convenience.	Students participate in a class in real-time through Zoom.
Hybrid refers to a course that is partially Face-to-Face (F2F) and Online Asynchronous (OA)		
In a HyFlex Model , students have the flexibility of moving across all three modalities as needed or desired.		

Course Technology

The students will be required to have access to and use a personal computer with access to the Internet. Word editing software will be required for written assignments.

The University of Florida and Digital Worlds requires that students have access to and ongoing use of a laptop/mobile computer for DIG courses in order to be able to function in the current learning environment. Digital Worlds requires each DAS major's laptop computer to meet certain minimum specs for heavy graphics use, the requirements documented below must be met. <https://digitalworlds.ufl.edu/programs/ba-in-digital-arts-sciences/technology-requirements/>.

Course Communications

Students can communicate directly with the instructor regarding the course material through the course management system (CANVAS) using "Canvas Mail".

Course Recordings

Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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 Support

Technology Support 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 requests please email support@digitalworlds.ufl.edu.

UF Computing Help Desk

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/>

Campus and Academic Resources

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information

on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

University Police Department: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).

Online Students Complaints: [View the Distance Learning Student Complaint Process](#).

Disclaimer: This syllabus represents the instructor's current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.