George Mason University
College of Education and Human Development
Learning, Design and Technology (LDT)

EDIT 772-002 – Virtual Worlds, Augmented Reality, and Gaming Applications
Independent Study
2 credits, Summer 2023
May 22, 2023 – July18, 2023
Online

Faculty

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Prerequisites/Corequisites

None.

University Catalog Course Description

Provides basic knowledge of available applications and platforms for creating contextually based learning environments such as immersive virtual worlds, simulated worlds, alternate reality games, and massive multiplayer online role-playing games for e-learning.

Course Overview

This course provides basic knowledge of the range of capabilities germane to augmented, virtual, mixed, extended, and immersive realities within an adult education context. Students learn to cultivate and to identify effective *design* strategies for creating engaging instructional products and learning assets. The summer session 2023 is independent study; you must direct your own studies in consultation with the instructor and the guidelines/content enumerated in the course syllabus. For this independent study, we will be using the Fall 2022, EDIT 772 course shell.

Immersive technologies and digital wearable technologies of today can convey information and transfer experiences in engaging ways. They can also offer new perspectives on content, motivate learners, and form the foundation of powerful, engaging, and authentic immersive learning experiences. To better understand how to leverage these technologies, our instructional

focus throughout this course will be firmly rooted at the intersection of instructional design, learning experience design, and principles of adult learning theory-situated cognition.

It is understood that effectively incorporating technology into education or the workplace requires much more than employing hardware or software in a classroom (virtual or face-to-face). The same is true for virtual worlds, augmented reality, and immersive reality. That is where we will spend our time, and these are the types of discussions I look forward to having with you.

As educators, it is understood that it is simply not enough to take a traditional, face-to-face offering and merely upload the course material to the web and call it a distance-mediated course. A well- designed distance education course requires specific design changes and interactions to make the course an effective teaching and learning environment.

This is a fun and creative class, but it is also a two-hour, graduate level offering. As such, you should be prepared to engage in some rigorous and demanding work. This course calls for an inquiry-based approach to learning, so *you* will explore resources and concepts individually in a self-directed manner.

No prior experiences with formal development of virtual reality, mixed reality, augmented reality, coding, or software editing are required to excel in this course. However, since this course incorporates digital technologies, you are expected to have a working knowledge of using the Internet and germane technologies/tools, an understanding of basic technical aspects of immersive technologies, and interest or insights related to various technology and delivery platforms. **You must be prepared to explore your own design instincts and rely on your classmates to clarify the application and use of the new technologies examined in this course.**

Course Delivery Method

This course will be delivered online (76% or more) using an asynchronous format via Blackboard Learn Learning Management System (LMS) housed in the MyMason Portal. You will log into the Blackboard Learn (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site is available now, and you have already been enrolled.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- **Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements. George Mason University's Kaltura Media Center, available free to students for posting AR/VR/XR related videos and demonstrations, can be used to post accessible videos and links in VoiceThread.**
- Most course readings and some multimedia resources are in the Course Reserves tab of the navigation menu.
- **You will need to borrow or purchase** a VR/AR headset or apps to experience VR/AR apps and to demonstrate your design ideas for class assignments/discussion posts. Some smartphones may also be used with AR/VR applications, and you can check the compatibility of your device by going to: https://www.mobilefun.co.uk/blog/2017/01/how-to-check-if-your-smartphone-supports-virtual-reality-headsets/.

  Free VR/AR Options on the Fairfax Campus
  VR headsets are freely accessible to students on or near campus at Horizon Hall in The Mix Makerspace from 10 a.m.-7:00 p.m. Eastern. Please contact The Mix to make arrangements or check the schedule before heading over:
  - E-mail: mix@gmu.edu
  - Instagram: @mixatmason
  - Website: mix.gmu.edu
  - Facebook: @mixatmason

  Purchase Options
  Merge VR Headset and Google Cardboard Headset are affordable options compatible with most iOS and Android smartphones. You are not required to purchase a VR headset/goggle as the tools you use depend on your capstone design project. You may also use other VR/AR headsets such as HTC Vive, Oculus Quest, PlayStation VR, Magic Leap, and Microsoft Hololens (Expensive!). It is acceptable to use AR/VR headsets currently deployed at your workplace or organization. If you are located near the Fairfax campus, VR headsets are feely accessible on campus in Horizon Hall in The Mix Makerspace.
- High-speed Internet access with standard, up-to-date browsers. To get a list of Blackboard Learn's supported browsers see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supported- browsers.
- To get a list of supported operating systems on different devices see here.
- Students must maintain consistent and reliable access to their GMU email and Blackboard Learn, as these are the official methods of communication for this course.

- Students will need a headset/microphone for use with the MetaVerse or Zoom Web conferencing software.

Expectations

- Course Week:
  This is an independent study, and it is asynchronous. Because asynchronous courses do not have a "fixed" meeting day, our week will start on Monday and finish on Sunday. Typically, each new module will be available on Monday mornings, and module assignments will be due on the following Sunday by 11:59 PM. Collaborative assignments (e.g., discussion postings, wikis, etc.) may have additional mid- week requirements to give your peers time to respond to your contributions. There are exceptions to these general rules, however, and you are encouraged to attend to the detailed course schedule available within this document and hosted in our Blackboard Learn course site. All assignments posted after their respective due dates will incur point deductions equivalent to 10% of that assignment's maximum possible points per day.
- Log-in Frequency:
  Students must actively check the Blackboard Learn course site and their GMU email for communications from the instructor. This must be completed no fewer than 2 times per week to foster active and meaningful course-related discussion.
- Participation:
  You must keep an online blog or vlog that supports video to complete weekly assignments. Students are expected to actively engage in all course activities. This includes viewing all course materials, completing all course activities and assignments, and participating meaningfully in all course discussions and group interactions as guided by the instructor for meaningful and fruitful independent study.
- Technical Competence:
  Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues:
  Students may encounter unforeseen technical issues. When students encounter a technological issue, they should try the following:

    1. Try to accomplish the task in a different way.
    2. Close and reopen the Internet browser and try the task again.
    3. Try performing the task in a different Internet browser.
    4. Seek instructor-based assistance if steps 1-3 did not resolve the issue.
    5. Choose another software for your AR | VR | XR Project
    6. **NEED HELP?** Contact Technical Support 24/7 - chat:

https://support.edu.help/ | call: 1-844-306-1785 | email: **Mason@support.edu.help**

Students should expect some technical difficulties at some point in the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.

- Workload:
  Please be aware that this course **is self-paced independent study.** Students are expected to meet specific deadlines and due dates listed in the Class Schedule section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities, and assignments due. Expect to log in to this course at least 2 times per week to read announcements, to participate in the discussions, and to work on course materials.
  1. Reading assignments and course content should take approximately 45-60 minutes to complete each week.
  2. Reviewing extension resources (e.g., videos, websites, etc.) should take approximately 45- 60 minutes to complete each week; and
  3. Thoughtfully completing course activities should take approximately 90 minutes per week.
  4. In total, this class should take no more than (on average) 3-3½ hours per week; this is an appropriate time commitment commensurate with a two-credit graduate course.
- Instructor Support:
  Students may schedule a virtual one-on-one meeting to discuss course requirements, content, or other course-related issues. Students should email the instructor to schedule a one-on-one session and include a preferred meeting method (e.g., phone, Blackboard Collaborate, Skype) as well as suggested dates/times. Office hours will be conducted in the **Metaverse, and I am always available during this time slot unless I notify you about a change in my schedule.**
- Netiquette:
  The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. The same goes for physical presence in virtual, immersive spaces. Respect the boundaries of others. Don't get too close. Don't touch! *Be positive in your approach with others and diplomatic in selecting your words*. Remember that you are not competing with classmates but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- Accommodations:
  Online learners who require effective accommodations to ensure accessibility must be registered with George Mason University Disability Services.

Learner Outcomes

This course is designed to enable students to do the following:

1. Apply a working knowledge of instructional systems design (ISD), learning experience design, and principles of adult learning (andragogy) to the creation of augmented, virtual, or immersive reality digital learning assets (prototypes, storyboards, videos, etc.).
2. Research critical factors related to digital learning assets for use in augmented, virtual, or immersive reality.
3. Discuss key characteristics and affordances of digital learning assets.
4. Explore different genres/sub-genres of digital learning assets in terms of their specific applications, affordances, and constraints.
5. Justify selection of digital learning asset exemplars
6. Design digital learning assets in relation to audience, purpose, design, etc.
7. Apply best practices of gamification to a variety of applications digital learning assets (including AR, VR, XR/MR, etc.)

Professional Standards

The course is designed to meet many of the essential Instructional Design Competencies as specified by The International Board of Standards for Training, Performance, and Instruction (ibstpi®):

- Communicate effectively in visual, oral, and written form.
- Select and use a variety of techniques for determining instructional content.
- Analyze the characteristics of existing and emerging technologies and their use in an instructional environment.
- Select or modify existing instructional materials or develop original instructional materials.
- Provide for the effective implementation of instructional products and programs.
- Identify and resolve ethical and legal implications of design in the workplace.

Required Texts

This course has no required textbook. The majority of course readings can be found in the Course Reserve section of the Bb menu and are catalogued week-by-week. Other readings can be accessed via links in “Learning Resources.”

Course Performance Evaluation

Successful completion on this course is predicated on active participation. Grades are earned,

not given. Your performance will be evaluated using rubrics shared with you by the instructor. It is important to complete each assignment on time and in accordance with assignment requirements and expectations. Your performance evaluation includes your blog posts, and students are expected to submit all assignments on time and in the manner outlined by the instructor (e.g., via Voice Thread, Kaltura, Blackboard Learn, etc.).

Assignment Descriptions (Weighted Totals)

Major Blog Writings/Video Posts 50%

- **Course Introduction:** Introduce yourself to the class (Live Meetup in Office Hours, May 24 @ 7:00 p.m. Eastern).

- **Woman in Motion Design Case Study Discussion-** Students will watch the documentary film Woman in Motion and explore the design documents created by NASA to solve the problem of diversity in the space program. Students will examine the original design documents and discuss how systematic design can be used to implement instructional or training solutions using immersive technologies.

- **Asynchronous Design Thinking Workshop-**You will use AR/VR/XR to devise a solution for a problem of practice assigned by the instructor using a process called design thinking. This approach replaces more traditional linear instructional design models such as ADDIE and instead focuses on developing empathy for users, defining the defining the instructional or performance problem, ideating or idea generation, prototyping, and testing. To complete this assignment, you will need to download the Design Thinking Bootleg cards provided for you in the assignment. Students will be presented with a problem of practice scenario and must use the *Design Thinking* bootleg cards and should post on each phase of the process in their Voice Thread.

- **Weekly blog post assignments/current events**, e.g., ethical decision making, technology leadership, etc.

AR | VR Technology Explorations 20%

1. You will complete **one** (1) technology explorations in this course**, one with an Augmented Reality (AR) tool or with a Virtual Reality tool.** Each technology exploration should include a presentation of 5-minutes or less and a brief presentation in Voice Thread. A list of suitable technologies is in Week 2 of Bb in the SWAY presentation with my video introduction.
2. Students will explore the tool and understand its capabilities to create **relevant immersive learning experiences in augmented reality (AR) or (VR) Virtual Reality.** Because these technologies are nascent, you must be

prepared to search for tutorials on how to use your chosen immersive technology tool online, at The MIX @ George Mason, Khan Academy, Google, Apple, or your smartphone provider (360 video, apps, etc.).

3. Each student will provide to the instructor a written document describing and reflecting on personal learning experiences with their chosen technology as it relates to creating a relevant immersive learning experiences **firmly grounded** in the principles and best practices of design thinking, learning experience design, or instructional design. Choose a problem of practice, an instructional problem, or a performance gap to which you apply the technology. The problem must be clearly stated in your Voice Thread post. Describe the learning or performance outcomes. Use Voice Thread tools to create your presentation which can include links, narration, video, PowerPoint slides, etc. Be creative!

4. In presentations, writings, or other demonstrations of learning, students should explore key concepts such as the instructional problem, AR/VR/XR technology type, location and organization for use, major affordances of the tool, the target audience, content focus, etc., Students should e-mail their presentations/papers to the instructor at dwilso31@gmu.edu; videos should meet accessibility guidelines and include closed captions or a transcript of your video presentation.

5. **Note: Describing the AR/VR/XR software's features/functions without linking them to a problem of practice, instructional problem, or a performance gap in an adult learning setting is not acceptable**. Your Voice Thread must demonstrate that you have used the software and not simply cut-and-paste information from a website. Use storyboards, prototypes, etc., to fill any gaps in your Voice Thread.

6. Students will present the highlights of their chosen technology's immersive learning capabilities. Think of this as high-tech show-and-tell for an audience of instructional designers and educational technologists. Presentations should run about 5-7 minutes maximum. The first technology demonstration is due at the end of Week 3 and the second in Week 7.

Final Assignment: AR, VR, XR Design Challenge Presentation & Paper: 30%

Overview

The design challenge is the culminating, performance-based assignment in this course. You will

select an adult learning context to describe and apply concepts from *Design Thinking* and your investigation of adult learning principles such as andragogy and situated cognition, and apply them to an identified instructional problem, performance gap, or training issue. Additional details for the Design Challenge project appear in the course assignment instructions in Bb.
You will:

1. Identify an instructional, training or performance problem in Week 2 using outline or similar format.
2. Conceptualize a high-level approach to solving the performance problem that uses AR/VR/XR:
    a. This could be an informal or formal learning context.
    b. Observe and analyze this learning context to generate ideas about the use of AR/VR/XR technologies using a Design Thinking process to address a performance gap or instructional problem.
    c. Be very specific about the adult learners, the context, and the learning goal, as well as the technology you plan to adapt for the design challenge.
3. Incorporate technology.
    a. Apply AR, VR, or XR to an adult learning or training setting or problem.
4. Connect situated cognition or another appropriate adult learning principle to your conceptual design:
    a. Think about how to deliver this instruction using AR/VR/XR.
    b. *Describe and visually represent* core parts or aspects of a potential technology-based learning/training intervention using AR, VR, or XR for your selected audience.
    c. *Establish and clearly present learning goals*.
    d. Predict how your AR/VR/XR intervention may impact your selected problem of practice, instructional problem, or performance gap.
5. Represent these ideas initially in outline form, then a 2-page design brief and with a companion 5–7-minute narrated presentation to share with the class in VoiceThread for final project presentations.
    a. See the required elements and instructions below.

Grading

Letter Grade	Total Points Earned
A	94%-100%
A-	90%-93%
B+	86%-89%
B	83%-85%
B-	80%-82%
C	70%-79%
F	<70%

Late Work

Students are expected to complete and electronically submit all assignments prior to 11:59 PM on each respective assignment's due date (see Class Schedule). All assignments—EXCEPT for collaborative activities (e.g., discussion board-related assignments)—can be submitted late but a minimum 10% late penalty will be assessed for work submitted after the assignment deadline. Work that is submitted over a week late will receive an additional 30% penalty for each additional week late. No late work is accepted after the final assignment's due date.

Professional Dispositions

Students are expected to always exhibit professional behaviors and dispositions. See https://cehd.gmu.edu/students/polices-procedures/.

This is a fun and creative class, but it is also a two-hour, graduate level offering. As such, you should be prepared to engage in some rigorous and demanding work. This course calls for an inquiry-based approach to learning, and you will explore resources and concepts individually and as a collaborative group. No prior experiences with formal development of virtual reality, mixed reality, augmented reality, coding, or software editing are required to excel in this course. However, since this is a course that both incorporates and is focused on digital technologies, you are expected to have a working knowledge of using the Internet and germane technologies/tools, an understanding of basic technical aspects of immersive technologies, and interest or insights related to various technology and delivery platforms.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: http://cehd.gmu.edu/values/.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see https://catalog.gmu.edu/policies/honor-code-system/).
- Students must follow the university policy for Responsible Use of Computing (see http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it

regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.

- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see https://ds.gmu.edu/).
- Students must silence all sound emitting devices during class unless otherwise authorized by the instructor

Campus Resources

- Questions or concerns regarding use of Blackboard Learn should be directed to https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/.
- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730 or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website https://cehd.gmu.edu/students/.

Course Calendar

Week	Dates	To Do	Assignments Due
1 Origins of Immersive Technologies	(Mon) May 22	**Read Learning Outcomes for this Week in Bb** ***Watch Course Conceptual Model Video:** Pedagogical Approaches to Graduate Education in Learning Experience Design Using Immersive	• Course Kickoff/Office Hours in Metaverse Workspace-Tuesdays **May 24, 2023 @ 7 p.m. Eastern.**

Week	Dates	To Do	Assignments Due
		Technologies Online with Dr. Wilson (In AR|VR|XR Video Channel; paper in Course Reserves) ***Read:** History of the Future by Blake Harris, Part 1, The Revolution Virtual, Chapter 1: The Boy Who Lived to Mod, pp. 5-20 (Week 1 Course Reserves) ***Read:** Dede, C.J et al, Virtual, Augmented, and Mixed Realities in Education (Week 1 Course Reserve) ***Read:** Brown, Collins, Duguid Situated Cognition and the Culture of Learning (Week 1 Course Reserve) ***Watch:** Ted Talk with Dinesh Punni (Runs 12:55 min | 2:18-12:55 has important definitions) ***Watch**: Dolly Oberoi Interview, "What's all the buzz about?"	
2 Intro to Basic Software and Hardware for Immersive Technologies	(Mon) May 29	**Read Learning Outcomes for this Week in Bb** ***Read:** Preface-Design of Everyday Things, Preface, vii to xv (Course Reserves-Also available as audio book)	• W2 Discussion Explore an AR/VR/XR tool and describe its affordances as part of your design project. E-mail this description to the instructor by Sunday, June 4, 2023 @ 11:59 p.m. Eastern.

Week	Dates	To Do	Assignments Due
		***Read**: Chapter 1, The Psychopathology of Everyday Things, pp 1-36 (Course Reserves) **Intro to Technology** ***Watch**: Explore AR/VR Technologies with Dr. Wilson, Video Intro to SWAY Presentation & Technology List)	
3 Design Thinking with Immersive Technologies	(Mon) June 5	**Read learning outcomes for this week in Bb.** ***Read**: Design Thinking by Tim Brown, *Harvard Business Review* (Course Reserves) ***Read:** Part 1, Identifying the Problem, Mintrop, pp 23-42 (Course Reserves) ***Read**: Bollman and Deal, *The Power of Reframing, Chapter 1. (Course Reserve)* ***Watch** the Design Thinking Tim Brown TED Talk ***Download** and "play" the **Design Thinking Bootleg** cards for use in recording your Voice Thread ***Create** a presentation demonstrating your design thinking approach to the problem of practice identified in the Week 3 Voice Thread Scenario.	• The Design Thinking video is due to the instructor via e-mail or video link in Kaltura @ 11:59 p.m. Eastern, Sunday, June 11, 2023 • Submit your outline for the AR/VR/XR Learning Experience Design Challenge to the instructor by Sunday, June 11 @ 11:59 p.m.

Week	Dates	To Do	Assignments Due
4 Principles of Universal Design	(Mon) June 12	**Read Learning Outcomes for this Week in Bb** ***Read**: Open Educational Resource (OER),Kearney, D.B. (n.d.), Module 1.1, 1.2, 1.3 **(In Week 4 "Learning Materials")** **Watch:** What is UDL (In Week 4 "Learning Materials" **Runtime 2:45 min)** **Watch**: TED Talk, The Myth of Average (In Week 4 "Learning Materials, Runtime 18:26 minutes)	• Week 4 writing prompt on how principles of universal design apply to your project are due Sunday @11:59 p.m.
5 Introduction to Basic Hardware and Software for Immersive Technology Part II	(Mon) June 18	**Read Learning Outcomes for this Week in Bb** ***Read:** The VR links in the Bb Learning materials folder. ***Watch** the videos in the learning materials folder ***Choose**: a *VR* technology to explore for your Voice Thread Discussion post.	• Week 5 Activity – Update on your final course project as a video or written paper posted to your blog setup for this course.
6 **Diversity and Inclusion in Virtual Worlds**	(Mon) June 25	**Read the learning outcomes for this week in BB** ***Watch:** Woman in Motion Documentary	• Week 6 Blog Post; initial post due Sunday, July 2, 2023 @ 11: 59 p.m. The topic is the film Woman in Motion, and you will be discussing the NASA executive design summary and how and why these were created as

Week	Dates	To Do	Assignments Due
		(In Course Reserves, 1h:35 min) ***Read:** Executive summary, NASA Astronaut Recruitment, Final Report, Women in Motion, Inc, pp.1-20 (In Course Reserves) ***Read**: Pate, A.L. (2020) Labster Case Study, Diverse Avatars and Inclusive Narratives in Virtual Reality Biology Simulations (In Course Reserves)	part of the designed solution to NASA's diversity problem. • **Work on Design Challenge and Final Presentation**
7 Ethical Decision-Making Immersive Technologies and Society	(Mon) July 3	**Read the Learning Outcomes for this week in BB** ***Read Readings:** See the Supplemental Readings Folder **Read**: The Metaverse Manifesto, in "Learning Materials"	**Blog post due Sunday, July 9.** • **Work on Design Challenge Document/Final Presentation**
8 Final Week	*Mon, July 10-Tue, July, 18) End of Independent Study	**Read the learning outcomes for this week in Bb.** ***Post**: final presentation to Voice Thread ***Post**: final Design Challenge paper to Bb Assignment. *Read Goleman, D. (2004). *What Makes a Leader* (In course Reserves)	• Design Challenge Paper & Presentation posted to your blog due Sunday July 16; • Complete Week 8 Blog post by Tuesday, July 18; I used to think? What do I think now? • **Complete the End of Course Evaluation.**