

**USC Iovine and
Young Academy**
*Arts, Technology and the Business
of Innovation*

ACAD 217 Designing Immersive Media

Units: 4

Spring 2023

Tuesdays & Thursdays - 5 to 7.50pm Pacific Time

Location: Iovine & Young Hall, Room 110

Instructors: Carsten Becker

Office: Zoom

Office Hours: As scheduled, or per Individual Request

Contact Info: Preferred communication channel is Slack

DM me in the **iya-becker.slack.com** workspace

For grades-related questions: carstenb@usc.edu

Allow up to 24 hours for replies to emails and messages.

Grader and/or Classroom Assistant/s: TBD

Office Hours (if applicable):

Contact Info:

IT Help:

<https://uscedu.sharepoint.com/sites/IYASStudent/SitePages/IT-Resources.aspx>

Hours of Service: 9 a.m. – 6 p.m.

Contact Info: iyahelp@usc.edu

*Experience is not what happens to you.
It is what you do with what happens to you.*

- Aldous Huxley

Course Description

Designing compelling XR experiences that effectively inspire audiences and entice interaction.

Students will be provided with an expert understanding, inspiration, and the design skills to foray into Augmented (AR) and Mixed Reality (MR) to create in multimedia landscapes without bounds.

Students will receive support in creating with the latest XR tools, and opportunity to connect with makers of cutting-edge experiences and XR software like Unity, Playbook, and Lightship SDK with industry guest visits.

Key Learning Objectives

1. Understand the potential of XR experiences for new ways to experience the world, raise awareness, create, or launch a product or service.
2. Gain an understand of cognitive and behavioral processes involved in sensory-spatial experiences.
3. Recognize the key role of good UX design in XR and create great user experiences themselves.
3. Acquisition of hands-on skills that allow students to build prototypes / sample scenes of experience.
4. Ability to ideate and successfully communicate all aspects of an immersive experiences (goal, audience appeal, feasibility, mechanics, user experience and impact).

Specific Skills to be Covered:

- Ideate along the potential of AR in a rapidly growing expansion into many areas of life
- Creation of visual assets (Adobe Creative Cloud, photography, 3d software)
- Use of tools to create Augmented Reality, Virtual Reality and other spatial experiences
- Practicing a productive creative process
- Fulfill various roles in a production team and together strive for success
- Regularly exercise group crit
- Documenting the process and outcome of your projects (in the form of video)

Prerequisites:

Previous knowledge of game engines and completion of ACAD 187 will be helpful (but not required).

Expectations

To master this course, a student will...

1. Develop a solid understanding of XR: Augmented Reality, Virtual Reality, the tech that make these possible, the creation process and success of examples in these media forms.
2. Acquire and demonstrate the software skills for building XR experiences. Employ various forms of immersive media to create adequate applications.
3. Actively support the success of the entire group by participating in group crits, collaborating etc.
4. Ideate applications of these new formats that promote discovery and positive life advancements, engaging with and for diverse groups of people.

A 4-unit class is defined as 4 hours of lecture, and students can be expected to spend up to 12 hours per week on the course. To meet all course goals, expect 6 to 8 hours per week outside of our class sessions for preparation, short-turnaround assignments, and project work.

Recommended Reading

“UX for XR”

by Cornel Hillmann (Apress, 2019)

ISBN 978-1-4842-7019-6 (Softcover, \$37.99 at Barnes&Noble)

ISBN 978-1-4842-7020-2 (ebook, \$26.49)

“Experience on Demand” (Research on the cognitive effects and potential of VR)

by Jeremy Bailenson (Norton, 2018)

ISBN 978-0-393-25369-6 6 (Paperback, \$16.95 at Barnes&Noble)

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Required Hardware/Software

- **Laptop Computer** (minimum i7 processor) with min, 100GB of hard disk space and the following software:
 - Reality Composer via installing XCode (free, needs Apple ID to download), or equivalent
 - Shapr3d (free with edu license), or another 3d program the student is already proficient in
 - Unity (free with edu license)
 - iTunes or Google Play account to download free mobile apps
- **3-Button Mouse with Scroll Wheel**
- Cloud Storage account (Google Drive, Dropbox, Microsoft OneDrive et.) for safely storing your project files
- **Instructor recommends keeping up-to-date backups in the cloud and on an external hard drive as well**
- For in-class instruction, **Headphones**. Over-ear / closed type only (no ear buds) so you can listen without disturbing others. Some recommended models: Audio Technica ATH-M50x, Sony MDR-7506 or equivalent

Academy Equipment

We may utilize the Academy's Mixed Reality Lab, sound, video and lighting equipment to create media content, and VR headsets to research, audition and publish VR work. Ask your instructor or the Systems personnel for proper training in the setup and use of the equipment so you can utilize these tools confidently in exercises and projects. Not having spent the proper time to figure out their full use will not be accepted as a valid reason for delays in submitting your assignments.

To check out valuable equipment you may need to acquire certification.

Equipment that is returned late or broken may lead to delays or restrictions in your subsequent check-out.

USC Technology Rental Program

The university realizes that attending classes online and completing coursework remotely requires access to technology that not all students possess. If you need resources to successfully participate in your classes, such as a laptop or internet hotspot, you may be eligible for the university's equipment rental program. To apply, please submit an [USC Technology Rental Program Application](#) .

HOW TO PURCHASE OPTIONAL SOFTWARE AT THE DISCOUNTED ACADEMY:

For classes that require them, the following software are available for purchase **online** through the USC Iovine and Young software catalog at the Academy discounted rate:

Software	IYA Short-Term License at USC Bookstore
Adobe Creative Cloud	\$70 2022–2023 annual license
Apple Logic Pro	\$35 semester licenses
Solidworks	\$35 semester license
Apple Final Cut Pro	\$35 semester license

To purchase:

- Visit: <https://commerce.cashnet.com/IOVINE>
- Select the software license(s) you would like to purchase by clicking "View Details" or the software title, and make your purchase
- You will receive an order confirmation receipt at the email address you provided
- You will be notified by email when the software license has been activated

If you have any questions about this process, please do not hesitate to contact Academy IT Support at iyahelp@usc.edu.

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Grading Breakdown

	Points	% of Grade
Participation ¹	100	12.5
30-Minute Prompts ² (12pts each)	108	13.5
Futuring Exercises (ideation only)	60	7.5
Quizzes and Tests	100	12.5
Projects (building full experiences)	332	41.5
Final Presentation & Exhibit Design	100	12.5
TOTAL	800	100

¹ Not just attendance. To receive an 'A' in participation, you must regularly contribute to the discussion in the classroom, in Mural, and be responsive to your peers and instructor on Slack

² Examples: Read or View & Reflect, installing an app, quick research, charting your process, etc.

Grading Scale (Example)

Course final grades will be determined using the following scale

A	94-100
A-	90-93
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Assignment Submission Policy

All labs, projects and assignments are due at the date and time specified in the syllabus. Projects that are more than 24 hours late will receive a 50% deduction in points. Projects that are more than 7 days late will receive 0 points. Be sure to check Blackboard if you have to miss a class. You are responsible for any materials presented and assignments made even if you are not in class that day.

Assessments and Assignments

Async Prompts recall or complete material from class. They might be reading assignments, completing a class exercise, or a preparation necessary to move ahead. Prompts are always due at the next meeting.

Tests recall technical knowledge that will be critical for your next Project.

Projects are more heavily weighted assignments that require research, ideation, creative design, and execution.

In Project 1, you'll create the concept and prototype of an Augmented Reality experience that engages users with a topic or product in a new way. Use of image anchor, and a sequence of interactions must be Part of the experience journey.

For Project 2, develop and execute an immersive narrative for audiences to interact with via a laptop or mobile device. Two students can pair up.

In Project 3, you will conceive, design and code a meaningful immersive experience for virtual reality in teams of 3 to 4 students. Concepts should be aimed at creating awareness for a social issue, or multi-user collaboration in new experiences with technology, art & design or productivity.

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Extensions

Each student may ask for an extension on one of their assignments during the term. The above Assignment Submission Policy strictly applies to the extension date given.

Grading Timeline

You will receive your score in prompts, tests, projects, and all graded exercises within two weeks of submission.

Academy Attendance Policy

The Academy maintains rigorous academic standards for its students and on-time attendance at all class meetings is expected. Each student will be allowed two excused absences over the course of the semester for which no explanation is required. Students are admonished to not waste excused absences on non-critical issues, and to use them carefully for illness or other issues that may arise unexpectedly. Except in the case of prolonged illness or other serious issue (see below), no additional absences will be excused. Each unexcused absence will result in the lowering of the final grade by $\frac{1}{3}$ of a grade (e.g., an A will be lowered to A-, and A- will be lowered to a B+, etc.). In addition, being tardy to class will count as one-third of an absence. Three tardies will equal a full course absence.

Students remain responsible for any missed work from excused or unexcused absences. Immediately following an absence, students should contact the instructor to obtain missed assignments or lecture notes and to confirm new deadlines or due dates. Extensions or other accommodations are at the discretion of the instructor.

Automatically excused absences normally may not be used for quiz, exam or presentation days. Using an excused absence for a quiz, exam or presentation, such as in the case of sudden illness or other emergency, is at the discretion of the instructor.

In the case of prolonged illness, family emergencies, or other unforeseen serious issues, the student should contact the instructor to arrange for accommodation. Accommodation may also be made for essential professional or career-related events or opportunities. Additionally, students who need accommodations for religious observations should provide advanced notice to instructors and student athletes should provide Travel Request Letters. All accommodations remain at the discretion of the instructor, and appropriate documentation may be required.

Spring 2023 addendum:

- Unless students provide an accommodation letter from USC's Office of Student Accessibility Services (OSAS) or a letter from IYA Student Services detailing visa or travel restrictions, attendance and active participation is expected in the classroom. Any student with such accommodations should submit their accommodation document to the instructor as soon as possible to discuss appropriate accommodations. Either classroom recordings or live remote access to the class via Zoom will be provided.
- Students who are experiencing illness should not attend class in person. Please inform the instructor in advance of any class sessions that you can't attend for medical reasons, and accommodations will be arranged to view recorded lectures and submit alternatives to any missed class participation. Students will not be penalized for not attending class in person under these circumstances.
- In the event that you find yourself experiencing COVID-19 related symptoms, in keeping with university recommendations, you should Stay home! This is the best way to prevent spreading COVID-19 as supported by scientific evidence; Please do not come to an in-person class if you are feeling ill, particularly if you are experiencing symptoms of COVID-19.

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Iovine and Young Hall Cleanout

The Academy is unable to store student projects and materials beyond the end of the semester. Students must remove all projects and personal materials from the Creators Studio, lockers/locker room, and other classrooms by the end of each semester. **All projects and materials left in Iovine and Young Hall will be discarded two days after final exams end. No exceptions.**

Additional Policies

Should the needs of the class dictate, I reserve the right to modify the class schedule and assignments. Any substantive changes will be announced in class and posted in Blackboard and/or Slack.

Classroom Norms

Students are expected to actively engage with the subjects of the course outside of the classroom. Assigned papers should be informed by research beyond common knowledge. Your solutions to weekly prompts and your course project are expected to be fulfilled from a personal point of engaging your skills, possess thematic merit and relevance to your maker / portfolio goals. Furthermore, instructor expects all students to documenting your own learning process, take an active role in the success of the group through contributing to discussion in the classroom, sharing of ideas, voluntarily providing constructive feedback for your peers, and supporting each other as teammates.

To make the above possible, phones must be put away while in the classroom. Use of laptops is allowed only for tasks relating to our course.

I recommend taking notes by pen in a notebook.

Synchronous session recording notice

I'll do my best to record lecture portions of our meetings. If you have to miss a class due to illness or isolating, you should find slides in Blackboard and you will have access to watch these recordings. But remember you are not permitted to share them with anyone not enrolled in the course.

SCampus Section 11.12(B)

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).

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Course Schedule: Weekly Breakdown

Notes: To accommodate course development and access to equipment, I reserve the right to alter the weekly topics and assignments.

30-Minute Prompts are always due the following course meeting and are not listed below.

Week 1

Intro to Augmented Reality (AR) Making

Lecture: AR in 2023 – technology, growing capabilities. ARkit & Xcode. AR Art.

Discuss: Design goals for immersive experiences. Sensory connections. Screen Space and World Space.

Software: Reality Composer

Assigned: Read the “History of XR” deck and ideate an Artifact for your first Futuring Challenge (FC1).

Week 2

Due before Tuesday session: Futuring Challenge 1

Project 1 Intro / Visual and UX Design for an AR Scene

Framing of Project 1 (AR Experience) followed by Lab: Project 1 ideation brainstorm

Due Thursday: Project 1 concept outline

Lecture: Sourcing / building visual elements. UX for rewarding experiences.

Software: Photoshop, Dimension (or student choice 3d Software), USDZ Conversion

Week 3

Due before Tuesday session: 3d and UI elements for your Project 1 AR scene

Project 1 Working Week

Use class time to design elements, composite them in Reality Composer/Aero and program the user experience and interactions with and of objects.

Software: As needed (e.g. Object Capture API for object anchors)

Week 4

Due before Tuesday session: Project 1 Final

No Lectures All Play (oh, and a Test)

Load & experience all Project 1 finals.

After introducing Quest2 headset to students, we'll take turns in curated VR experiences (from productivity to games to mental wellness), as well as apps on mobile devices that explore new narrative formats.

Test 1: AR Knowledge

Assigned: Async 30-minute prompt: Identify the ‘4 Reward Components’ of an experience you played

Week 5

Due before Tuesday session: Unity, Student Account & IDE installed (will receive instructions async)

Unity Lab 1 / Sensory Immersion

Lecture: Unity markets. Low poly vs Photo-Realism. 3DOF s 6DOF.

In-class tutorials (finish async)

Lecture/In-class Experiments: Immersive situations with a deliberate use of color, form, physical movement, spatial sound, cognizance of self and reciprocity evoke deeper audience engagement.

Assigned: Pitch a unique experience using sensory immersion to connect participants with a memory (FC2).

Week 6

Due before Tuesday session: Futuring Challenge 2

Unity & Playbook Lab

Lecture: C# coding basics. Volumetric capture.

Framing of Project 2 (mobile narrative) followed by Lab: Project 2 ideation brainstorm

Industry Guest Presentation: Playbook

Software: Playbook with Unity, interplay

Assigned: UI exercise, and Project 2 concept outline

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Week 7

Due before Tuesday session: Project 2 (P2) outline with UX map and moodboard

Project 2 Working Week

Lab: Design elements, build UX and interactions

Unity Lab cont'd: Brackey. Unity Recorder.

Assigned: Complete first full run of experience and output for feedback

Submit list of improvements.

Week 8

Project 2 Working Week

Lecture/Lab: Bringing a rigged character into Unity. Animating objects and camera.

Lab: Advance all aspects of your P2: narrative, design, UX.

Industry guest presentation: Niantic Labs: Lightship SDK

Week 9

Due before Tuesday session: Project 2 Final

Transition to Unity-based VR and AR

Load & experience all Project 2 finals

Framing and building teams (averaging 3 students) for Project 3

Instructor provides Teams with feedback on Project 3 proposal (on realistic scope, aligning with rubric etc.)

Test 2: Unity basics

- Spring Break -

Week 10

Due before Tuesday session: Final Project 3 (P3) proposal with team member roles clearly defined

Learn to build in VR and Motion Capture Workshop

Lecture: UX for VR. Spatial exploration.

Unity Lab cont'd: VR - - - for teams with AR concepts: Lightship training

Assigned: P3 teams to finalize concept with detailed sketches, UX map, moodboard, asset list

Week 11

Collaborating in Unity

Demo & Lab: Plastic. Ways to deploy to the Quest2.

P3 Team members advance work in their areas.

Lecture: Mixed reality - The importance of gesturing with our bodies.

Week 12

Project 3 Working Week

Lecture: Avatars and the worlds they'll inhabit

P3 Team members advance work in their areas.

Lecture: The power of extended reality for assistive and health applications.

Industry updates from CES and SXSW

Week 13

Project 3 Working Week

P3 Team members advance work in their areas.

Each team deploys to Quest2 (or AR devices), gathers feedback from peers.

Submit list of improvements.

Test 3: VR (Unity & Quest2)

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Week 14

Project 3 Working Week

Test drives: Complete design, UX and UI
P3 Team members advance work in their areas.

Week 15

Project 3 Wrap-Up and Rehearsals

Last round of improvements to P3s
A look at the Quest Pro and Apple Headset
Full presentations with working prototypes on-device

Important dates: March 13 to 17 – Spring Break

April 26: All Final Presentations must be complete for rehearsal run-through

May 4, 4pm – Final Presentations

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

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Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call

Studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086

eeotix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776

osas.usc.edu

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, **HSC:** (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, **HSC:** (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-3340 or otfp@med.usc.edu

chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.