

USC Iovine and Young Academy

*Arts, Technology and the Business
of Innovation*

Course ID and Title: ACAD 288: Constructing Digital Worlds

Units: 4 Units

Term: Spring 2024 Day: Tues/Thurs Time: 4-6PM

Location: IYH111

Instructor: Adam Hughes

Office: HSH 105

Office Hours: Tue 3-4 6-7PM or apt

Contact Info: adamhugh@usc.edu cell: 9096336182

(text only and only during normal working hours please)

IT Help: <https://usc.edu.sharepoint.com/sites/IYAStudent/SitePages/IT-Resources.aspx>

Hours of Service: 8:30 a.m. – 6:30 p.m.

Contact Info: iyahelp@usc.edu

Catalogue Description

Nvidia Omniverse, Digital Twins, AI, Synthetic Data Generation, 3D data aggregation, Workflow Optimization, Realtime render / Real time Collaboration / Large Scale Data

Course Description

Omniverse is a first-class platform for adopting USD-based workflows. Connect your favorite industry-leading 3D tools for streamlined pipelines or build your own USD applications. The latest OpenUSD updates to the popular software enable 3D artists to enhance productivity and efficiency in generative AI-enabled content-creation workflows. Explore foundation applications built on the Omniverse platform to accelerate your workflow and projects. Each application is provided as source code, so developers and technical teams can inspect, customize, and enhance the apps themselves—or build your own with [Omniverse Kit](#).

Course includes an investigation of techniques specific to Open USD (developed by Pixar) and use in Nvidia's omniverse Platform. Students will be encouraged to creatively make and design digital twins of the process of the world; whether that's a digital twin of a room, home, building, school, factory, city block or working product.

<https://www.nvidia.com/en-us/omniverse/>

Learning Objectives

Students will be able to demonstrate:

- A knowledge of Open USD

- Competency of various apps in the Omniverse Platform (Composer, Explorer, Presenter, Code, Showroom)
- An understanding of the scope/depth of data aggregation processes
- A knowledge of Digital Twins
- Capability to critique scenes and layout
- Project/File organization

Prerequisite(s): Windows 10 or 11 (Computer Lab)

Co-Requisite(s): n/a

Concurrent Enrollment: n/a

Recommended Preparation: Solidworks Experience, 3D Software Experience, ACAD 188 and/or ACAD 189

Technological Proficiency and Hardware/Software Required

Nvidia Omniverse Software

Current PC computer with 32GB Ram and I7 or greater CPU and dedicated RTX GPU 2080ti or better

HOW TO PURCHASE SOFTWARE AT THE DISCOUNTED ACADEMY RATE

The following software are available for purchase online at the Iovine and Young Academy discounted rate:

Software	IYA Short-Term License at USC Bookstore
Adobe Creative Cloud	\$70 2024–2025 annual license (active through July 2023)
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.

Required Readings and Supplementary Materials

NvLearn Training Content, Course supplementary training videos, Demo File workflows

Optional Readings and Supplementary Materials

Omniverse KIT, Presenter, Composer, Configurator, Variant, Physx whitepapers/research papers

Description and Assessment of Assignments

Students are responsible for all assignments, including homework, in-class work, critiques, presentations, demos, readings, process, and archiving work on removable media. It is the student's responsibility to obtain missed work and information missed if absent. For this type of Omniverse class, it is crucial for students to attend class since often information is exchanged in a group discussion, critique or similar setting may not imparted through handouts or notes. Students are responsible to schedule time, outside class time, to access 3D equipment and practice manufacturing techniques. Students must attend class online or inperson to succeed in the course.

Grading Breakdown

Projects will be evaluated based on their adherence to given guidelines, attention to craft and overall appropriateness. Initiative, progress and follow-through will also be considered. Both giving and receiving feedback will be crucial to your success in the class; therefore your participation grade is based on your active involvement in class and critiques. Assignments will be docked one full letter grade each week they are late. Absence is not an excuse for late work.

93 – 100	A = 4.0
90 – 92	A- = 3.7
85 – 89	B+ = 3.3
80 – 84	B = 3.0
75 – 79	B- = 2.7
70 – 74	C+ = 2.3
65 – 69	C = 2.0

30% Individual Design

25% Collaborative Class Design Project

25% Assignments; sketchbook and in-class exercises

20% Creative effort, Class participation, attendance, improvement, quizzes

Assignment Submission Policy

Late assignments are reduced per week by 10 percent

Course Specific Policies

Show up and engage in class. Laptops away unless its part of course work and instructed by Professor.

Course 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 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.

[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.

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.

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 the day after final exams end. No exceptions.**

Zoom Etiquette

Attendance check randomly by turning on your web camera throughout the lesson.

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. 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. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

USC Learning Experience Evaluations

Participation is not required but highly encouraged, I personally read each submission every semester.

Course Schedule

Week	Content	Reading
WEEK 1	Intro to Omniverse – RTX Showroom In class assignment/practice	Intro to Kit reading
WEEK 2	Intro to USD (livrps) In class assignment/practice In class exercise (group product improvement)	Intro to USD reading
WEEK 3	Omniverse USD Presenter and USD Code In class assignment/practice Design Project Discussion	Presentor Docs
WEEK 4	Omniverse USD Explorer In class assignment/practice Direct Digital Manufacturing Discussion/Techniques	Explorer Docs
WEEK 5	Omniverse USD Explorer Factory Planner In class assignment/practice In class exercise (individual product improvement)	What does it mean to be a factory planner?
WEEK 6	Collobrative Factory Planning (Group) In class assignment/practice Design Project Discussion	NvLearn – Factory Planning
WEEK 7	USD Composer In class assignment/practice Asset Library	Composer Docs

WEEK 8	USD Composer Practice and Explore tools Stage Hierarchy Organization	NvLearn Docs
WEEK 9	USD Explorer/Composer Individual Project Aggregate Data In class assignment/practice	Data Aggregation paper
WEEK 10	USD Explorer/Composer Individual Project Guidance In class assignment/practice In class exercise (group product improvement)	NvLearn Collaborative work
WEEK 11	USD Explorer/Composer Individual Project Delivery In class assignment/practice Physx options	Project assembly reading
WEEK 12	USD Explorer/Composer Class Project Aggregate Data In class assignment/practice	Project assembly
WEEK 13 review	USD Explorer/Composer Individual Project Guidance In class assignment/practice In class exercise (group product improvement)	Project feedback and
WEEK 14	USD Explorer/Composer Individual Project Milestone #1 review In class assignment/practice	Project feedback and
WEEK 15	USD Explorer/Composer Individual Project Milestone #2 In class assignment/practice	Project feedback
WEEK 16	USD Explorer/Composer Individual Project Delivery In class assignment/practice	Project critique

Statement on Academic Conduct and Support Systems

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Policy for the use of AI Generators

Use them as often and as frequent as possible, make sure the work you turn in is authentically yours.

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

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

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

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

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

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 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) 740-0411

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

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

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) 442-1200 – 24/7 on call

Non-emergency assistance or information.

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

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) 442-2850 or otfp@med.usc.edu

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