



Course ID and Title: CTPR 446: Virtual Production

Units: 4

Prerequisites: CTPR 445 (Realtime CG Filmmaking) or CTAN 564L (Motion Capture Fundamentals) or one of the following: CTPR 421 Practicum in Editing; CTPR 438 Practicum in Producing; CTPR 464 Practicum in Production Design; CTPR 534 Intermediate Production Design; CTPR 535 Intermediate Editing; CTPR 538 Intermediate Producing.

Term—Day—Time: Spring 2024 / Tues 4pm-6:50pm Lecture / Lab: TBD

Location: RZC 117

Instructors: John Brennan, David Nessler, Everett Lewis

Office: RZC 117

Office Hours: TBD based on student and instructor availability.

Contact Info: john.brennan.iii@gmail.com, nessl@usc.edu, elewis@usc.edu

Teaching Assistant: TBD

Office:

Office Hours:

Contact Info:

IT Help: Creative Tech

Hours of Service: Mon – Fri (8am – 7pm)

Contact Info: creativetech@cinema.usc.edu

Course Description

Virtual production is an area that brings people together from live-action and CG disciplines with various artistic or technical skills. In keeping with this spirit, this combines disciplines from the Production, IMGD and Animation departments to collaborate and produce projects using cutting-edge virtual production techniques.

Students will have hand-on training within the motion capture stage volume, understand the practice of gathering and building CG assets for virtual production, direct and export mocap performances and virtual camera cinematography to bring fully fledged ideas, concepts and stories to life in a virtual environment.

From the initial production breakdown to the final cut - this course is an exercise in filmmaking in real-time and working as a production team to bring forth the best possible outcome on screen.

Learning Objectives

- Create short-form virtual production projects using cutting-edge digital tools and film techniques.
- Specialize in certain areas of virtual production while working as a crew.
- Utilize motion capture technology for character performance and real-time filmmaking.
- Integrate virtual camera and editing into the production process.

Course Notes

Prepare an animatic to pitch in the first few weeks of the course and consider various roles in virtual production to see where you'd fit best. Be prepared to understand various crew positions including Director, Operator, Director of Photography, Animator, Production Designer and Post-Production Supervisor. Have fun and enjoy the freedom of virtual production and real-time filmmaking.

Technological Proficiency and Hardware/Software Required

Knowledge of Motive, Motion Builder, Unreal Engine required. Animation fundamentals and technical skills within modern filmmaking pipelines encouraged.

Optional Readings and Supplementary Materials

- *The VES Handbook of Virtual Production*, Edited by Susan Zwerman and Jeffrey A. Okun.
- *The War for Art* by Steven Pressfield.
- Gathering Assets:
 - <https://www.unrealengine.com/marketplace/en-US/store>
- Tutorials:
 - Tutorials for the course will be available in the Course Materials folder for CTPR 446, under Tutorial Videos.

Description and Assessment of Assignments

- **Pitch/Breakdown:** Prepare a short film or vis pitch that uses virtual production techniques. Include a script, short logline, shot breakdown and scope of your idea to verbally present your project to the instructors and fellow classmates.
- **Animatic:** Create a rough animatic of proposed project, detailing each shot and performance in line with the script or experimental concept.
- **Assets/Rigs:** Understand and use Unreal Engine's realistic Metahuman rigs, or begin characterizing unique character, creature or experimental rigs specific to your project. Use the Unreal marketplace to find environments, vehicles, props and specialized assets within you production.
- **Production:** Use the motion capture stage volume with other students, fulfilling specific roles needed for performance capture to output mocap data for rough scene assembly and retargeting in post-production/editing.
- **Cleaning/Motion Editing:** Learn and apply motion capture cleaning techniques for chosen performances. Use Motorica AI to produce movement for certain performances and needs.
- **Motive – Motion Builder – Unreal LiveLink:** Stream real-time data as performance or captured takes into Unreal Engine to record takes and build specific scenes.
- **Rough Cut:** Cut together a rough version of your project. Include as much information as possible with temporary or final assets, soundtrack and placeholder storyboards or text to demonstrate story, pace and final vision. Present your rough cut during class-time for instructor and student feedback.
- **Virtual Camera:** Understand the pipeline to begin recording virtual camera shots within Unreal that are specific to your project.
- **Final Cut:** Complete a final cut with a TRT of 5-10 min in length with sound design and necessary post work completed.

Participation

Class participation is greatly encouraged, and group participation is required for all students.

Grading Breakdown

Table 1 Grading Breakdown

Assessment Tool (assignments)	Points	% of Grade
Pitch and Production Breakdown	10	Week 2,3
Assets, captured data, assembled scene	25	Week 5,6
Rough Cut	20	Week 9,10
Final Cut	35	Week 14,15
Participation	10	
TOTAL	100	

Grading Scale

Table 2 Course Grading Scale

Letter grade	Corresponding numerical point range
A	95-100
A-	90-94
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

Assignments must be submitted on time, no exceptions. Late submissions must be cleared by instructors under the pretense of legitimate excuses, medical emergencies and personal matters.

Grading Timeline

Students can expect grading and feedback from the instructor during class critiques and no more than two weeks after assignments have been submitted.

Participation

Class participation is key to learning technology, software interface and operating the motion capture system. It's incredibly important to attend each class in order to pitch ideas, showcase work, gain knowledge and problem solve with instructors on-hand. Attendance is 10% of your total grade so please try to attend each class on time.

Classroom norms

This class works at reflecting a professional virtual production studio where students are required to communicate verbally, work collaboratively and produce unique and artistic work for artistic purposes. Respect and positive thinking is greatly encouraged.

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](#).

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).

Course Schedule

	Topics/Daily Activities	Readings/Preparation	Deliverables
Week 1	Introduction. Discuss class and begin ideation.	Pre-production	
Week 2	Project pitches and production breakdown	Pre-production	Pitch materials: Script or short description, production breakdown of shot list, assets, actors, TRT and overall goal.
Week 3	Animatic	Pre-production	Create a visual layout in real-time of storyboards showing your shot progression with a rough soundtrack and SFX.
Week 4	Assets	Production	Gather character rigs, environments, vehicles and props.
Week 5	Motion Capture	Production	Capture mocap data necessary for the performances in your project.
Week 6	Motion data editing, cleaning and characterization	Production	Use Motive and Motion Builder to clean mocap data, characterize rigs and bake performances and props.
Week 7	Rough cut midterm presentation	Production	Present a rough cut of your project to the class for feedback and critique.
Week 8	Pipeline data streaming	Production	Stream real time data and captured performances across the network from Motive and Motion Builder, into Unreal Engine.
Week 9	Virtual Camera	Production/ Post-production	Use the Unreal LiveLink system to capture specific camera shots with the V-Cam.
Week 10	Class work	Post-production	Work on your projects in class with the instructors at hand to assist with problems and questions.
Week 11	Guest speaker	Seminar	
Week 12	Final assets	Post-production	Have all hero assets ready for compiling the final cut of your project.
Week 13	Class work	Post-production	Work on your projects in class with the instructors. Use the motion capture stage to collect pick-up shots.
Week 14	Class work	Post-production	Work on your projects in class with the instructors. Use the motion capture stage to collect pick-up shots.
Week 15	Study Week	Post-production/Editing	Finish and export the final cut of your film to present in class.
FINAL	Final Film Screening		Refer to the final exam schedule at classes.usc.edu .

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, 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. All incidences of academic misconduct will be reported to the Office of Academic Integrity 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.

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.