



CTAN 465 Digital Effects Animation

Units: 2.0

Spring 2024—Friday Lecture/Lab—7:00-9:50pm

Location: Zemeckis Center for Digital Arts (RZC) 117

Instructor: Domin Lee

Office:

Office Hours: By Appointment

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Student Assistant: Tammy Nguyen

Office:

Lab Hours:

Contact Info: tammyngu@usc.edu

IT Help: Creative Tech Help Desk

Contact Info: creativetech@sca.usc.edu or 213-821-4571

Hours of Service:

Course Description

This course will survey the tools and techniques to successfully create a spectrum of effects-based animation in computer-generated imagery (CGI), using Autodesk Maya and Houdini animation software. Equal in importance but complementary to character animation, effects animation has a long tradition of creating environmental performances such as water, fire, explosions, and destruction in film. The course will expose the advancing 3d animation student with all aspects of digital effects animation, including particles, dynamics, and fluids. The course will encompass a series of hands-on exercises, so a prior basic working knowledge of Maya or other 3d application is essential. Exposure to Side Effects Houdini, a leading effects 3D application, is also provided from additional workshops.

Course Goal

The overall course goal is to leave the student with a general foundation of all aspects of effects in Maya, and to deliver an appreciation for how to create digital content with the software.

The coursework is designed to make sure the student is exposed to all relevant aspects of effects creation with Maya with an eye toward giving the student a base foundation from which to explore and expand. As such, the course will be flexible to the needs and pace of the class itself and will use the following weekly schedule as a basis only. Therefore, it is of the utmost importance to keep pace as best as possible and not allow weekly assignments to accumulate over time.

Weekly exercises emphasizing design and production techniques will force the student to discover Maya. Be prepared to work about 3-4 hours a week (including the designated three hours of lab time) outside of class.

This class is not just about learning software. Anyone can do that at home with a book and some patience. This class is about exploring creativity using an extremely creative and technical tool using left brain tinkering and right brain thinking. The more of yourself you put into it, the more questions you can raise with myself and the SA, and the more you will learn.

Learning Objectives

When the student completes the course, he or she will be able to:

- Be more comfortable creating effects inside the Maya paradigm
- Compare differing workflows and be able to decide on how best to proceed with a creative challenge
- Understand nParticles, nCloth, fluid solvers and their settings
- Create effects such as fire, smoke, sparks, and explosions
- Integrate effects with various elements in the scene
- Create procedural effects in Houdini

Prerequisite(s): 1 from (CTAN 452 or CTAN 462)

Co-Requisite(s): N/A

Concurrent Enrollment: N/A

Recommended Preparation: N/A

Course Notes

Attendance is very important in this course to receive the full breadth of the material. We will be covering a little bit of everything in Maya, with some time in class to practice each concept. The course strives to be flexible to the needs of the class, and particular attention may be paid to certain concepts and subjects as the class requests.

Technological Proficiency and Hardware/Software Required

Autodesk Maya and Sidefx Houdini are required throughout the course and is available in the classroom and designated labs. Furthermore, a student edition of the software may be downloaded for free from Autodesk.com and Sidefx.com. Please make sure to download the same version as the one used in the class to avoid any compatibility issues. Some assignments may need to use Adobe Photoshop for image editing as well as simple editing using Apple iMovie or Adobe Premier for example (these basics are shown in class – no need to know them beforehand, but helpful).

Required Readings and Supplementary Materials

No readings are required; however, the following is recommended:

- Introducing Autodesk Maya 2016. Dariush Derakhshani. Wiley, 2015. ISBN: 978-1119059639.

This text should be available at the University Bookstore as well as online and in bookstores.

- o 2016 version of the book is still relevant to Maya 2022.

The book follows the exercises and content that is covered in class, and so will be a good resource.

Description and Assessment of Assignments

Assignments are given on a weekly basis to reinforce the concepts introduced in class. Time will usually be given to practice the concepts and advance on the weekly assignments during the lecture period, to allow for individual Q&A with the instructor and SA as needed. Assignments will be judged on completeness, punctuality, and effort displayed.

Grading Breakdown

Assessment Tool (assignments)	Points	% of Grade
Attendance	15	15 %
Participation	10	10 %
Weekly Assignments	50	50 %
Final Project	25	25 %
TOTAL	100	100

Grading Scale

(Optional – the following is only an example of what one might look like if included)

Course final grades will be determined using the following scale

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 are to be copied to the server location at the beginning of each class. Each class will begin with a review of student assignments from the previous week, to encourage discussion and further understanding of the different workflows possible within animation.

Assignments **must be named** according to the following: **Lastname_Firstname_AssignmentTopic**

Grading Timeline

Feedback is given the day assignments are turned in, as well as anytime additional/extra feedback is requested by the student. *Please don't hesitate to come talk to me about any additional feedback or help.*

Additional Policies

Since attendance is important to this course, more than 3 absences may impact a student's grade. Furthermore, it is the responsibility of the student to catch up on any missed assignments or lecture material. Please keep in mind that USC no longer differentiates between excused or unexcused absences.

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 Evaluations

Course evaluation occurs at the end of the semester university wide.

Course Schedule: A Weekly Breakdown

The weekly schedule may need to change as the course goes on. This is a rough guideline as to what you can expect. Remember, it is important to keep up with each class, as this course will be flexible. If you do miss a class, make sure to check in with the SA immediately. The breakdown below gives you an idea of what we will cover in class. The exercise and/or design assignments given are due the following week, unless otherwise noted.

IMPORTANT:

In addition to in-class contact hours, all courses must also meet a minimum standard for out-of-class time, which accounts for time students spend on homework, readings, writing and other academic activities. Standard fall and spring sessions (001) require a final summative experience during the University scheduled final exam day and time.

	Topics/Daily Activities	Deliverables
<i>Week 1</i> 1/12/24	Workflows, Pipelines of Animation Production	Brainstorm Ideas for Final Project
<i>Week 2</i> 1/19/24	Maya nParticle and Emitter Exercises: Rain / Snow	<i>Previsualization of FX.</i> https://docs.arnoldrenderer.com/display/A5AFMUG/Learning+Scenes
<i>Week 3</i> 1/26/24	nParticle Collision and Sprites Exercises: Chimney Smoke	Rain / Snow
<i>Week 4</i> 2/2/24	Maya Fluid Exercise: Torch Fire	Chimney Smoke
<i>Week 5</i> 2/9/24	Maya Fluid with Particles Exercise: Magical Wisps	Fire
<i>Week 6</i> 2/16/24	Maya nCloth Exercises: Flag	Magical Wisps
<i>Week 7</i> 2/23/24	Maya Rigid Body Dynamics I Exercise: Shatter	Flag
<i>Week 8</i> 3/1/24	Maya Rigid Body Dynamics II Exercise: Dust	Shatter
<i>Week 9</i> 3/8/24	Maya Mel Scripting Exercise: UI Final Project Announcement	Dust
<i>3/15/24</i>	Spring Recess	
<i>Week 10</i> 3/22/24	Houdini Overview Exercise: Rope with Sweep	UI
<i>Week 11</i> 3/29/24	Houdini Wrangle / VOP Exercise: Rocks	Final Previs
<i>Week 12</i> 4/5/24	Houdini Procedural Modeling Exercise: Entagma	Final Status Update I
<i>Week 13</i> 4/12/24	Houdini Particles Exercise: vdb toolset	Final Status Update II
<i>Week 14</i> 4/19/24	Houdini Particles Exercise: vdb toolset	Final Project

<i>Week 15</i> 4/26/24	Presentation and Submission of final projects.	Final Project Revisions (optional)
April 27 -30	STUDY DAYS A final project will be turned in by students in lieu of a final exam. This project is to be presented on the final class day (4/26/24) as listed in the schedule above, and may be revised and turned in for final after the study days by May 3 rd , 2024.	
Final 5/3/24	Final Project Revisions: If the student chooses to make revisions or improvements to their final projects based on feedback on the final presentation on 4/28, these must be turned in by May 3 rd at 9pm.	

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, comprises 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.

PLEASE NOTE:

FOOD AND DRINKS (OTHER THAN WATER) ARE NOT PERMITTED IN ANY INSTRUCTIONAL SPACE IN THE SCHOOL OF CINEMATIC ARTS COMPLEX