CTAN 465 Digital Effects Animation
Units: 2.0
Spring 2021—Wednesday Lecture—7:00-9:50pm;
Thursday Lab 1:00-3:50am

IMPORTANT:
The general expectation for a standard format course offered in a standard 15-week term is that the number of 50-minute contact hours per week should equal the number of semester units indicated and that one semester unit entails 1 hour of class time and 2 hours of outside work (3 hours total) per week. Standard fall and spring sessions (001) require a final summative experience during the University scheduled final exam day and time.

Please refer to the *Contact Hours Reference* to see guidelines for courses that do not follow a standard format and/or a standard term.

Location: Zemeckis Center for Digital Arts (RZC) 117

Instructor: Domin Lee
Office:
Office Hours: By Appointment
Contact Info: dominlee@usc.edu

Teaching Assistant:
Office:
Office Hours:
Contact Info:

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 omcputer-generated imagery (CGI), using Autodesk Maya and Houdni 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 prio 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

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 technique 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 **highly** 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 The 2016 version of the book is still relevant to Maya 2018 and 2019.
        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 introduce 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 cacth up on any missed assignments or lecture material. Please keep in mind that USC no longer differentiates between excused or unexcused absences.

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	Readings/Preparation	Deliverables
Week 1 1/12/22	Workflows, Pipelines of Animation Production	How Toy Story Creator Pixar Revolutionized Animation	Previsualization of FX. https://docs.arnoldrenderer.com/display/A5AFMUG/Learning+Scenes
Week 2 1/19/22	Maya nParticle and Emitter Exercises: Rain / Snow	The Wolf of Wall Street VFX Highlights	Rain / Snow
Week 3 1/26/22	nParticle Collision and Sprites Exercises: Chimney Smoke	Gone Girl Featurette - Visual Effects Breakdown	Chimney Smoke
Week 4 2/2/22	Maya Fluid Exercise: Torch Fire	Why CG Sucks (Except It Doesn't)	Fire
Week 5 2/9/22	Maya Fluid with Particles Exercise: Magical Wisps	Kubo and the Two Strings Featurette - Creating the VFX Masterpiece (2016)	Magical Wisps
Week 6 2/16/22	Maya nCloth Exercises: Flag	The Jungle Book 'Creating the Animals and the Jungle' - VFX Breakdown by MPC (2016)	Flag
Week 7 2/23/22	Maya Rigid Body Dynamics I Exercise: Shatter	Making of "2012" before-and-after by Uncharted Territory	Shatter
Week 8 3/2/22	Maya Rigid Body Dynamics II Exercise: Dust	Disney's Practical Guide to Snow Simulation	Dust
Week 9 3/9/22	Maya Mel Scripting Exercise: UI Final Project Annoucement	The Future of Visual Effects (VFX)	UI
3/16/20	**Spring Recess**		
Week 10 3/23/22	Houdini Overview Exercise: Rope with Sweep	The Future of Ray Tracing	Final Previs
Week 11 3/30/22	Houdini Wrangle / VOP Exercise: Rocks	Disney Animation Designer Breaks Down	Final Status Update I

		Cinderella's Dress Transformation	
Week 12 4/6/22	Houdini Procedural Modeling Exercise: Entagma	The Lion King 2019 - Making Of - How it was filmed in a realistic way	Final Status Update II
Week 13 4/13/22	Houdini Particles Exercise: vdb toolset	Disney's Practical Guide to Path Tracing	Final Status Update III
Week 14 4/20/22	Houdini Particles Exercise: vdb toolset	AWN @ FMX 2019: Danny Dimian Talks 'Spider-Man: Into the Spider-Verse' VFX / How Animators Created the Spider-Verse | WIRED	**Final Project**
Week 15 4/27/22	**Presentation and Submission of final projects.**	**TBD**	**Final Project Revisions (optional)**
April 30 - May 3	**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 (4/20/22) as listed in the schedule above, and may be revised and turned in for final after the study days by May 4, 2022.**		
Final 5/4/22	**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 5th at noon.**		

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 scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call
engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

Student Health Leave Coordinator – 213-821-4710
Located in the USC Support and Advocacy office, the Health Leave Coordinator processes requests for health leaves of absence and advocates for students taking such leaves when needed.
https://policy.usc.edu/student-health-leave-absence/

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
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) 740-4900 – 24/7 on call
engemannshc.usc.edu/rsvp
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086
equity.usc.edu, titleix.usc.edu
Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421
studentaffairs.usc.edu/bias-assessment-response-support
Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710
studentaffairs.usc.edu/ssa
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.
Diversity at USC - (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.

Diversity and Inclusion
Diversity and Inclusion are foundational to the SCA community. We are committed to fostering a welcoming and supportive environment where students of all identities and backgrounds can flourish. The classroom should be a space for open discussion of ideas and self- expression; however, SCA will not tolerate verbal or written abuse, threats, harassment, intimidation or violence against person or property. If students are concerned about these matters in the classroom setting they are encouraged to contact their SCA Diversity and Inclusion Liaison, http://cinema.usc.edu/about/diversity.cfm; e-mail diversity@cinema.usc.edu. You can also report discrimination based on a protected class here https://equity.usc.edu/harassment-or-discrimination/

Disruptive Student Behavior:
Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Judicial Affairs for disciplinary action.

PLEASE NOTE:
FOOD AND DRINKS (OTHER THAN WATER) ARE NOT PERMITTED IN ANY INSTRUCTIONAL SPACES IN THE CINEMATIC ARTS COMPLEX