



CTAN 452 Introduction to 3D Computer Animation

Units: 2.0

Spring 2020—Weds Lecture—7:00-9:50pm;

Friday Lab 9:00-11:50am

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: SCB 102.

Instructor: Fredrik Nilsson

Office:

Office Hours: By Appointment

Contact Info: fnilsson@usc.edu

Teaching Assistant: John Stover

Office:

Office Hours:

Contact Info: jmstover@usc.edu

IT Help: Please coordinate IT and user account issues through our Teaching Assistant

Hours of Service:

Contact Info: Creative Tech (213) 841-4571

or email creativetech@cinema.usc.edu

Course Description

This course introduces students to the basics of computer animation and how major studios operate within their pipelines. We will be exploring many features and workflows using AutoDesk Maya 2019.

(Modeling, Texture/Surfacing, Rigging, Animation, Dynamics, Lighting.)

Concepts will be reviewed and demonstrated using Maya. Students will gain knowledge by following along in class as well as creating their own projects and exercises that cater to their own interests.

Course Goal

Overall course goal is to leave the student with a general foundation of all aspects of production 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 CG 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 inside the Maya paradigm
- Compare differing workflows and be able to decide on how best to proceed with a creative challenge
- Create hard surface models using polygon modeling techniques
- Model simple organic and curved surfaces using a few NURBS techniques
- Organize objects and scenes with hierarchies
- Set and edit keyframes to suit the timing needs of the animation
- Create and apply simple skeletal rigs and controls
- Setup scenes and objects for animations, including automated animation setups
- Make materials to simulate object properties and the look of surfaces
- Light and render scenes and animations to create a sense of mood

Prerequisite(s): N/A

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 is 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. 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 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 and Participation	25	25%
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.

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 1/15/20	Introductions, Pipelines of Production & Workflows.		Sketch or find reference of a simple wind up toy mouse.
Week 2 1/22/20	Maya Interface. Object Creation, Manipulation, Animation, and Hierarchies.		Start Planning out a room that will house your Rube Goldberg Machine.
Week 3 1/29/20	Basic Computer Graphics & Solar System Project.		Solar System Project
Week 4 2/5/20	Various Modeling Techniques.		Build a nice wooden box for the toy mouse.
Week 5 2/12/20	Introduction to UVs and Texture Mapping		Plan and start building Rube Goldberg Machine
Week 6 2/19/20	Introduction to Lighting and Rendering		Rendered Box/Mouse (Turntable)
Week 7 2/26/20	Introduction to Bones and Skinning		Rigged Asset (Windup Toy Mouse)
Week 8 3/4/20	Introduction to Animation (Gravity, Weight, Overlap)		Basic Animation (Bouncing Ball)
Week 9 3/11/20	Character Animation (Adding Character/Personality)		More Animation (Pendulum & Cute Ball with Tail)
3/18/20	Spring Recess		
Week 10 3/25/20	Advanced Character Animation		Basic Walk Cycle on simple rig & Animated Toy Mouse
Week 11 4/1/20	Cameras, Shots & Set Dressing		Staged Set/Camera with previz for all assets.
Week 12 4/08/20	More Lighting and Rendering with Arnold.		Refine Set/Camera/Lighting

Week 13 4/15/20	Introduction to Effects Dynamics and Simulation		Refine Set/Camera/Lighting Add Simple Effects
Week 14 4/22/20	Addressing Notes and Polishing Shots. Industry Trends.		Refine Project
Week 15 4/29/20	Presentation and Submission of Final Projects.		Final Project
May 2-5	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 (4/29/20) as listed in the schedule above, and may be revised and turned in for final after the study days by May 5, 2020.		
Final 5/6/20	Final Project Revisions: If the student chooses to make revisions or improvements to their final projects based on feedback on the final presentation on 5/1, these must be turned in by May 8th 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