

IML 354

# Introduction to 3D Modeling

**Spring 2021**

**2 units**

**Hybrid Course**

**Zoom Meetings:** Wednesday (January 20/April 28) 1:00pm - 2:30pm

**Office Hours:** Wednesday 2:45pm - 3:45pm

**Prerequisites:** None Recommended

**Instructor:** Silvia Rigon

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**Office Hours:** Wednesday 2:45pm - 3:45pm + additional TBD

**TA:** Emilia Yang

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## COURSE DESCRIPTION

This course introduces students to the history and theory of spatial representation and conveys foundational authoring skills in modeling and interactive 3D spaces. 3D modeling is the basis for many forms of image creation with digital media, be it for the construction of virtual architectures, environments, animation or game asset creation. Understanding and mastering techniques of 3D representation with the computer provide students with foundational knowledge not only to create their own computer-graphics models but also to move on to advanced techniques in computer-aided fabrication such as 3D printing.

Building on an introduction that covers the historical role of spatial representation we examine how techniques such as linear perspective impact our perception of the world around us and how they relate to large conceptual shifts in culture, society and art. Through a combination of primary texts such as Leon Battista Alberti's first treatise on linear perspective and Guy Debord's *Theory of the Dérive*, the course explores the cultural context of spatial representation and in parallel gives a practical hands-on introduction to modeling techniques.

The exercises, readings, discussions and assignments in this class are designed to support two primary goals:

1. Convey knowledge about spatial representation and its cultural implications;
2. Develop foundational authoring skills in 3D modeling and animation with programs like Autodesk Maya and Unity3D.

This course is the first in a sequence of courses introducing 3D authoring skills and provides the scaffolding to more advanced creative uses of 3D.

## LEARNING OBJECTIVES

At the end of the course, a student should be able to:

1. Identify essential elements, techniques and learning resources of 3D modeling, 3D animation, and 3D interactive simulations utilized across different media art and design genres.
2. Develop a personal aesthetic demonstrating imaginative and independent solutions with authoring skills in 3D modeling and animation with programs like Autodesk Maya and Unity3D
3. Demonstrate an understanding of cultural contexts and implications of concepts of spatial representation.

## COURSE STRUCTURE

The course is conceived as a studio in which students get a practical hands-on introduction to multiple approaches of 3D modeling. Over the course of the semester students will complete three projects conceived to foster an iterative understanding of the representation of space in digital media. Additionally, readings and discussions will help students to contextualize the technology and frame their projects.

The course will be held predominantly online, with a mixture of synchronous and asynchronous modes. Students are recommended to reach out as soon as possible if experiencing limitations to access to the necessary technology to complete the assignments. The course material will be accessible via Google Classroom and is organized on two-week modules that will become progressively available.

SCA Viewing Portal: <http://scacommunity.usc.edu>

MA+P Community: <https://map.usc.edu/community/>

## TECHNOLOGICAL PROFICIENCY AND HARDWARE/SOFTWARE REQUIRED

Google Classroom: <https://classroom.google.com>

Autodesk Maya Free Student Licence <https://www.autodesk.com/education/free-software/maya>

Minimum computer requirement: [Maya 2020 system requirement](#)

## REQUIRED READINGS AND SUPPLEMENTARY MATERIALS

Adobe Creative Suite recommended.

Readings will be provided as digital PDF files or via web links

## GRADING BREAKDOWN

- Assignment #1 20%
- Assignment #2 20%
- Assignment #3 40%
- Reading response 10%
- Participation/Peer Review 10%

## DESCRIPTION AND ASSESSMENT OF MAIN ASSIGNMENTS

### **Assignment #1: ANTHROPOCENTRIC SPACE (Envisioning Objects of Resilience), 20% (due Week 5)**

Model an object in Maya according to the description.

Export four screenshots in four views including top, side, front and perspective.

**(WIP milestone. Due Week 3)** Submit 6 sketches of your concept.

### **Assignment #2: ARCHITECTURAL SPACE (Creating the Poetic Space), 20% (due Week 9 )**

Create a larger architectural or scenographic scene in Maya populated with objects. You need to be the original creator of each element in the scene. The use of found models are not permitted. Use lighting, materials and composition to help tell a story. Submit 6 image renders using Arnold exploring different Views and framing. Make your renders 1280HD.

**(WIP milestone. Due Week 7)** Upload six test screenshots of your scene with completed models and/or placeholders. Materials and Lighting are not required for the WIP milestone.

### **Assignment #3: TEMPORAL SPACE (Unfolding Events), 40% (due Week 14 )**

Build on the scene to create a looping animation between 20 and 30 seconds long. You can use the same set of your previous assignment or add new elements to the scene. Experiment with both camera and object animation. Make your animation 1280HD.

**(WIP milestone. Due Week 12)** Submit a low-quality preview of your animation as well as four 1280x720 still-image test renders from key moments in the animation.

**All assignments** must be accompanied by a **200/300-word reflection** of the research and creative processes. All writing should be written and structured as a formal writing assignment and properly edited and cited. Assignment should be uploaded **before** the class on the date due.

Each assignment will be graded according to the following guidelines.

<b>50% Milestone</b>	<b>2/10</b>
<b>Completion</b>	<b>2/10</b>
<b>Technique</b>	<b>2/10</b>
<b>Concept</b>	<b>2/10</b>
<b>Ambition</b>	<b>2/10</b>
<b>Total</b>	<b>10/10</b>

## OTHER ASSIGNMENTS DESCRIPTION

**Reading Responses, 10%**

In addition to the class projects, there will be reading assignments with an accompanying critical reflection. Responses should be posted before the class on the date due. All writing should be written and structured as a formal writing assignment and properly edited and cited. Reading responses may include non-textual media, for example images, drawings, video or other sensory media that help support your analysis. Follow prompt or direction in Google classroom.

### **Selected Texts**

1. Anthony di Mari, Nora Yoo, Operative Design: A Catalogue of Spatial Verbs
2. Lister, Dovey, Giddings, Grant, Kelly: Immersion: a History
3. Herve Descottes, Celia E. Ramos, Architectural Lighting: Designing with Light and Space
4. Scott McCloud: Time Frame

### **Peer Review/ Participation/ Discussion, 10%**

Peer review is an important aspect of class. It helps practicing critical analysis while giving more awareness of how personal work is perceived by others. Each project will include a class critique and a structured peer review which may take different formats.

### **Formative Assignments, Extra credits 5%.**

Over the course of the semester students may be asked to complete small assignments that work towards a general understanding of core concepts and principles. Typically these assignments will begin in class during the hands-on tutorial session.

## **ASSIGNMENT SUBMISSION POLICY**

Assignments should be submitted the night before the class meeting on Thursday night at 11:59 on Google Classroom

## **PARTICIPATION POLICY**

MA+P classes often depend on group work and in-class critique, which makes participation crucial. You are expected to participate in every scheduled class session. This might be through in-person attendance, virtual attendance, or asynchronous viewing of class recordings and subsequent feedback/discussion. If you must miss a class, please be sure to get any notes and assignments from a classmate so you do not fall behind.

For students attending class virtually in Zoom, please log in using your **USC-enabled Zoom** account for security purposes. It is also recommended that you keep your camera turned on so you can better interact with the class and participate in class activities. Use your USC email account to log into Zoom.

If you feel that you are unable to participate in the ways listed above, please speak to your professor. Accommodations may be made for certain situations.

## **GRADING SCALE**

Course final grades will be determined using the following USC scale:

A      95-100

A-	90-94	
B+	87-89	
B	83-86	
B-	80-82	
C+	77-79	
<b>C</b>	<b>73-76</b>	<b>MINIMUM PASSING GRADE FOR MEDIA ARTS + PRACTICE MAJORS</b>
C-	70-72	
D+	67-69	
D	63-66	
<b>D-</b>	<b>60-62</b>	<b>MINIMUM PASSING GRADE FOR USC</b>
F	59 and below	

## ACADEMIC POLICIES

### SCA Diversity and Inclusion Statement:

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 persons 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](mailto:diversity@cinema.usc.edu). You can also report discrimination based on a protected class here <https://equity.usc.edu/harassment-or-discrimination/>

### Course Content:

The required materials (readings, screenings, etc.) that are used in this course may, at times, depict or address potentially sensitive subject matter. Our discussions in class may also include these topics. The selection and presentation of these materials do not amount to an endorsement of the ideas expressed in them. If you have personal concerns about any of these materials, please discuss them with your professor so they may arrange appropriate alternatives if needed.

### 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.

### 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" <https://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, <http://policy.usc.edu/scientific-misconduct>.

**Statement on Fair Use:**

Fair use is a legal principle that defines certain limitations on the exclusive rights of copyright holders. MA+P projects are produced with fair use doctrines in mind using its four pillars: (1) the purpose and character of use, (2) the nature of the copyrighted work, (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole, and (4) the effect of the use upon the potential market for or value of the copyrighted work. Generally speaking, this means you must only use as much of a copyrighted work as is necessary to make your point, and you must cite your sources accordingly.

**Citation Guidelines:**

We assert that work produced in our classes is covered under the Doctrine of Fair Use. In order to make this claim, however, all projects must include academically appropriate citations in the form of a References section, which covers all sources, in order to receive a passing grade. The References section is either included in the project itself or as a separate document, as appropriate. For citation purposes, we follow Kairos Journal of Rhetoric, Technology and Pedagogy style guide; Kairos uses [APA format](#), which is slightly modified and whose general guidelines and specific examples may be found here:

<http://kairos.technorhetoric.net/styleguide.html#apa>

**Computer Coding:**

Computer code is often shared and reused. This is appropriate in a MA+P course unless otherwise directed by the assignment. If you do use code, you should attribute it. Please follow these protocols from MIT which call for placing a comment in one's code with a URL to the original source, a note if it was adapted, and the date of retrieval: <https://integrity.mit.edu/handbook/writing-code>

**Research:**

Need to do research but don't know where to start? Searching for a book, article, or data to support your argument? Not sure how to cite a source in your bibliography? Ask a librarian!

Research help is available:

- In person and by phone, chat and email at Ask a Librarian
- Through research guides and FAQs
- By contacting your subject librarian

USC Libraries: <https://libraries.usc.edu/>

**Zoom Safety and Etiquette**

- For the safety of the classroom environment, students must login to Zoom through their USC account. <https://usc.zoom.us>
- Students should mute their microphones when they are not speaking.
- If possible, students are encouraged to enable their webcam, so they are visible in the course.
- Students should refrain from eating during the class.

Please contact the instructor with questions or concerns prior to the class session to discuss expectations and accommodations needed.

**Synchronous session recording notice**

Zoom session links will be posted on Google Classroom

Synchronous sessions will be recorded and provided to all students asynchronously.

### **Sharing of course materials outside of the learning environment**

The sharing of any synchronous and asynchronous course content outside of the learning environment is prohibited and against USC university policy.

SCampus Section 11.12(B)

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. 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 relation to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).

### **COVID-19 Information for Students Coming to Campus**

USC has COVID-19 and health protocols requirements for students who will be coming to campus. Please consult the [USC COVID-19 resource center website](#) for the latest COVID-19 testing and health protocol requirements. Requirements are continuously updated so please check frequently. Students should also stay informed with the "We Are USC" portal: <https://we-are.usc.edu/students/>. Students are also expected to follow the [University's Expectations on Student Behavior](#).

### **PLEASE NOTE:**

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

### **SUPPORT SYSTEMS:**

Counseling and Mental Health - (213) 740-9355 – 24/7 on call

[studenthealth.usc.edu/counseling](http://studenthealth.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

<https://policy.usc.edu/student-health-leave-absence/>

*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.*

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call

[suicidepreventionlifeline.org](http://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 and Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

*Free and confidential therapy services, workshops, and training for situations related to gender-based harm.*

USC Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

*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. 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. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.*

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213)

821-8298 [usc-advocate.symphlicity.com/care\\_report](https://usc-advocate.symphlicity.com/care_report)

*Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity / Title IX for appropriate investigation, supportive measures, and response.*

The Office of Disability Services and Programs - (213) 740-0776

[dsp.usc.edu](https://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 Campus Support & Intervention - (213) 821-4710

[campussupport.usc.edu](https://campussupport.usc.edu)

*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](https://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](https://dps.usc.edu), [emergency.usc.edu](https://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) 442-1200 – 24/7 on call

[dps.usc.edu](https://dps.usc.edu)

*Non-emergency assistance or information.*

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

[ombuds.usc.edu](https://ombuds.usc.edu)

*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.*



## WEEKLY TOPICS AND SCHEDULE:

<b>Week 1</b>	<b>01/20</b>	<b>Getting started. Maya Interface</b>
<b>Week 2</b>	<b>01/27</b>	<b>Introduction to 3D Polygonal Modeling</b>
<b>Week 3</b>	<b>02/3</b>	<b>Advanced Techniques of Polygonal Modeling</b> <i>WIP Project #1 due. Objects of Resilience.</i>
<b>Week 4</b>	<b>02/10</b>	<b>Sculpting Meshes and 3D Painting Tools</b> <i>Reading #1 due. Operative Design: A Catalogue of Spatial Verbs</i>
<b>Week 5</b>	<b>02/17</b>	<b>Shading and Material Techniques in Arnold</b> <i>Project #1 due. Objects of Resilience</i>
<b>Week 6</b>	<b>02/24</b>	<b>Understanding Texture Mapping</b> <i>Reading #2 due. Immersion: a History</i>
<b>Week 7</b>	<b>03/3</b>	<b>Lighting, Cinematography, Rendering</b> <i>WIP project #2 Architectural Space</i>
<b>Week 8</b>	<b>03/10</b>	<b>Principles of Animation. Keyframe. Deformers</b> <i>Reading # 3 due. Designing with Light and Space</i>
<b>Week 9</b>	<b>03/17</b>	<b>Cinematography: animating cameras</b> <i>Project #2 due. Architectural Space</i>
<b>Week 10</b>	<b>03/24</b>	<b>Animate Along a Path</b> <i>Reading #4 due. Time Frame</i>
<b>Week 11</b>	<b>03/31</b>	<b>Intro to N-Particles and N-Cloth</b>
<b>Week 12</b>	<b>04/14</b>	<b>MASH procedural Animation</b> <i>WIP project #3 due. Temporal Space</i>
<b>Week 13</b>	<b>04/21</b>	<b>Output to Video</b>
<b>Week 14</b>	<b>04/28</b>	<b>Animation Presentation</b> <i>Project # 3 due</i> <i>Final Presentation. Temporal Space</i>