ACCAD 5002

Computer Animation I, 3 units

Course Overview

Instructor: Kyoung Lee Swearingen

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Preferred method of contact: Email

Location:
ACCAD, Sullivant Hall Rm 349-A
Credit hours:3

Catalog Description

This course offers a comprehensive introduction to the art and craft of 3D computer animation, encompassing the entire production pipeline. Students explore the variety of techniques of modeling, texturing, shading, rigging, animating, camera layout, lighting, rendering, and compositing. Emphasizing practical hands-on learning through studio work and critiques, the course also integrates theoretical insights into cinematography and visual storytelling to foster the understanding of 3D animation as a narrative tool. It is designed for students from diverse disciplines and accommodates various levels of experience and background, making it suitable for beginners to advanced learners.

Course Description

This course introduces students from multiple disciplines to the core concepts and techniques of 3D computer animation. Through studio-based learning complemented by critiques and discussions, students will navigate the complete industry-standard animation production pipeline -from story and character design to modelling, texturing, shading, rigging, animating, camera layout, lighting, rendering, and compositing. Emphasizing the integration of cinematography principles with animation techniques, the course aims to enhance the visual and narrative depth of students' projects. This foundational experience not only prepares students for advanced studies in computer animation but also equips them to incorporate these skills into diverse fields such as game design, digital art, filmmaking, and visual effects. Graduate students are encouraged to integrate coursework to their thesis research.

Course Learning Outcomes

- **Understand and Implement the 3D Animation Production Pipeline**: Gain a comprehensive overview of the stages involved in producing a 3D animation, from conceptualizing to final rendering.
- **Develop 3D modelling skills**: Learning and apply basic techniques of polygonal and parametric modelling to create geometrically sound and aesthetically pleasing 3D objects.
- **Examine Texturing and Material Application**: Acquire skills in texturing and learn how to effectively apply materials and UV maps to 3D models.
- **Implement Rigging and Animation Techniques**: Understand the principles of rigging and control setups for character animation and apply keyframe animation techniques to bring characters and scenes to life.

- **Apply Cinematography Concepts in 3D Environments**: Utilize basic cinematography theories such as camera angles, movement, and composition to enhance the narrative quality of animations.
- **Enhance Scenes with Lighting and Rendering**: Learn visual storytelling skills through exploring various lighting and rendering techniques to create mood, focus, and depth in animations, and learn to solve various rendering problems.
- **Build Fluency in Computer Graphics Terminology:** Learn and apply key terminology related to 3D computer graphics, animation, modeling, texturing, rigging, lighting, and rendering.
- **Explore Contemporary Trends and Inspiration in Computer Animation:** Engage with readings, case studies, and visual media to understand evolving techniques, aesthetic directions, and industry practices.
- **Participate in Peer critiques and Collaborative Learning**: Actively engage in class discussions and critiques, providing and integrating feedback to refine, iterate and improve animations.
- **Prepare for Advanced Study**: Establish a solid foundation in 3D animation principles to prepare for more specialized or/and advanced courses in computer animation, filmmaking, game development and other related fields.

Course Methodology

1. Studio format requires active production work and discussion of the process and outcomes by all of us. Class sessions will consist of *working sessions* as well as *critiques and discussions* focusing on the progress of individual student project work. For our studio to be productive students must be committed to the production of their own work and participate in discussions about their own and their colleagues' projects.

2. During the semester we will complete phases of project development, prototyping, and production as well as journaling and several formal writing exercises as a means of distilling the project experience. These are all mandatory. Readings, viewings, and discussions are intended to give you a better understanding of design research, animation, gaming, and developments in the field and to get you ready for your project work.

3. Be prepared to work on your projects outside of class. You should invest minimally 9 hours/per week in this class. You will be able to work during our studio, but it is likely that you won't have enough time to complete the work unless you put in extra hours outside of our class time.

4. ***Students will present their work in sessions each Wednesday and Friday.*** Students will be expected to make an organized and coherent presentation of their individual and group progress each Wednesday. Be prepared to take notes on all the discussion directed at your work and integrate helpful comments into it and your next presentation to the group or the professor.

5. Adherence to deadlines is expected. It is the individual student's responsibility to keep track of the deadlines and to present the work to the class and instructor on the specified dates. Late or missed deadlines will result in a lowered grade of 10% per day.

6. Due to the nature of the project work, **students are expected to be working onsite at ACCAD and within the community**. Problems with "offsite" systems and/or incompatibility will not be an acceptable excuse for missed assignments or lack of progress.

Prerequisites

No Prerequisites

How this course works

Recommended books

1. Advanced RenderMan, Creating CGI for Motion Pictures by Anthony A. Apodaca

(https://www.google.com/books/edition/Advanced_RenderMan/6_4VaJiOx7EC?hl=en&gbpv=1&printsec=frontcover)

2. The Art of 3-D Computer Animation and Imaging by Issac Victor Kerlow (https://www.amazon.com/Art-3-D-Computer-Animation-Imaging/dp/047136004X)

Mode of delivery

The course meets in-person.

Credit hours and work expectations

This is a **3-credit-hour lab/studio**. According to Ohio State policy (go.osu.edu/credithours), students should expect 5-6 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 3-5 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Participation requirements

Attendance

Animation is a field that requires discipline, timely participation, and respectful, thoughtful communication. Consistent, on-time engagement is critical in all formats used to deliver this course. You are expected to come prepared and participate actively in each class. Spontaneous and planned learning experiences and discussions are impossible to recapture or duplicate. Attendance will be taken.

ACCAD recognizes that students may occasionally miss class due to illness, emergencies, or other significant matters. When this occurs, it is your responsibility to obtain updates and notes from a peer and to review any related course materials on Carmen for the class you missed.

Tardy policy

- Arrivals 1–20 minutes late are marked Tardy.
- Three (3) Tardies = one (1) Absence.
- Arrivals more than 20 minutes late are marked Absent.
- (Leaving early follows the same thresholds.)

If you anticipate an absence or delay, please notify the instructor in advance when possible. Documentation may be requested for extended or repeated absences.

ACCAD attendance expectations:

ACCAD acknowledges that illness, family obligations, and other conflicts with your classes do occur from time to time. We do not distinguish between excused and unexcused absences.

For courses that meet twice per week, up to three absences are allowed for any reason during the semester without penalty. All absences from class will be counted, however, and if three absences have occurred, you are required to initiate a meeting with your instructor to discuss what is preventing your attendance, and strategies for avoiding additional absences. If you do not initiate this meeting prior to being absent a fourth time, you will receive an “E” grade for the course when your fourth absence occurs. If you meet with your instructor before missing a fourth class, you may be allowed additional absences at your instructor’s discretion, but ANY student who misses more than six class meetings in a semester will earn an “E” grade. Students who are registered with SLDS and have approved Flex Plans should follow the attendance requirements that are designated there.

Our approach to attendance is summarized in this table:

	ABSENCES	CONDITION	CONDITION
CLASS MEETS TWICE PER WEEK	1-2	None	No effect on grade
	3	None	Final course grade lowered by one full letter
	Before 4th	Must meet with instructor If meeting not held	Number of allowed absences determined E grade assigned for 4th absence
	4-6	# of additional absences approved at instructor's discretion of allowed by SLDS accommodations	E grade assigned if maximum exceeded

Making productive use of class time and meeting in-progress deadlines are also factors of the professional behavior this course is intended to cultivate. Students are expected to be present and active for entire class periods. Frequent tardiness or leaving early can, therefore, impact your project/course grades in a detrimental manner.

Use of learning management system (Carmen)

You will use Carmen to upload digital files of completed assignments for evaluation unless otherwise specified for an assignment or exercise. Carmen may also be used for class discussions and providing feedback (including scores/grades). Announcements in Carmen will inform all students about schedule modifications or alternative planning. Teams can also be used for communication and for sharing information and files, if specified by your instructor.

Office hours (optional)

My office hours are a great time to receive one on one instruction or conversation with me, but they are optional.

Grading and instructor response

How your grade is calculated

Category	Points and/or Percentage
Assignment #1	10%
Assignment #2	10%
Assignment #3	10%
Assignment #4	10%
Assignment #5	10%

Category	Points and/or Percentage
Assignment #6	10%
Assignment #7	10%
20 In Class Exercises + key terminology to research	20%
Participation and Professionalism	10%
Total	**100%**

Description of major course assignments

Assignment #1
In this assignment, students will create a 3D environment.
deliverables: the project (movie file), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #2
In this assignment, students will add materials and textures onto the environment they created from Assignment #1
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #3
In this assignment, students will create a character and add rigs to it.
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #4
In this assignment, students will create cameras and dress the set with props.
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #5
In this assignment, students will animate the character that they created and rigged from Assignment #3.
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #6
In this assignment, students will add lights and environment fog for visual storytelling.
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

Assignment #7
In this assignment, students will add sound, title, and credits and render the sequence to finalize the film.
deliverables: the project (executable), reflection statement, self-evaluation form
self-evaluate based on the given rubrics.

In-Class exercise and key terminology to research
Students will follow each class demonstration and complete the associated exercises. The syllabus provides a list of key terms for independent research. Students are expected to investigate these terms and document their findings in a notebook (pen or pencil). Notebooks will be reviewed on a regular basis.

Participation and Professionalism

Students will be evaluated based on how active and engaged they are in in-class critiques and presentations.

Students are evaluated on how actively and respectfully they engage in in-class critiques and presentations, both as presenters and as respondents.

- **Poor (0 pts): Gives no feedback to peers; does not engage with critiques or apply feedback.**
- **Average (1 pt): Rarely gives feedback; minimally responsive to feedback received.**
- **Good (2 pts): Regularly offers constructive feedback; takes notes on feedback received and makes visible attempts to apply it.**
- **Excellent (3 pts): Consistently provides specific, helpful feedback; helps peers problem-solve; keeps thorough notes; promptly and thoughtfully incorporates feedback.**

Late assignments

In courses at the 2000 level and in non-major courses, students are granted a two-day grace period after due dates with no penalty for lateness (no matter the cause), as long as they have notified their instructor that a submission will be late prior to its deadline. Emailed notification is preferred.

Total scores for an assignment submitted more than 48 hours after a deadline will be reduced by 10%. Scores for any work submitted more than seven (7) days after a deadline will be reduced by 50%. All course work must be submitted by the last regular class meeting of the semester to be eligible for evaluation/grading. Flex plans for students registered with SLDS will be honored.

In courses at the 3000, 4000, and 5000 levels, no grace period is provided and total scores for assignments submitted up to 7 days after a deadline will be reduced by 10%. Total scores for assignments submitted more than 7 days after a deadline will be reduced by 50% as long as they are received by the last regular class meeting of the semester. Flex plans for students registered with SLDS will be honored.

Our approach to accepting late submissions is summarized in this table:

	TIME FRAME	PENALTY	CONDITION
2000 LEVEL COURSES AND COURSES FOR MAJORS	48-hour grace period	No penalty	Notify instructor before official deadline
	3 - 7 days late	10% deduction	
	8 days late – last class meeting of the semester	50% deduction	
3000-5000 LEVEL COURSES	0-7 days late	10% deduction	
	8 days- last class meeting of the semester	50% deduction	

Departmental Grading Scale

A (93–100) Work, initiative, and participation of exceptional quality

A- (90–92.9) Work, initiative and participation of very high quality

B+ (87–89.9) Work, initiative and participation of high quality which reflects higher than average abilities

B (83–86.9) Very good work, initiative and participation that satisfies the goals of the course

B- (80–82.9) Slightly above average work, initiative and participation that satisfies the goals of the course

C+ (77–79.9) Average work, initiative and participation which reflects an understanding of course material

C (73–76.9) Adequate work; student has a less than average level of initiative and participation

C- (70–72.9) Passing but below good academic standing; student has a less than average level of work, initiative and participation

D+ (67–69.9) Below average work, initiative and participation

D (60–66.9) Well below average work, initiative and participation

E (59.9–0) Failure; no credit. Unsuccessful completion of work. Limited or no participation. Objectives of the assignment are not met or are met in a significantly limited way.

Instructor feedback and response time

Project grading and feedback can generally be expected within two weeks of the submission of work. You can expect to receive an update on your performance status in my course before the middle of Week 4 and the end of Week 10 (at minimum). As your instructor, I am here to help and support you. Please engage with me either via Carmen, email, TEAMS, or in person by scheduling an appointment. I will make every effort to reply to emails within 24 hours M-F, but do not guarantee a response between 8pm and 7am or on weekends.

Course Materials and Technologies/Tools

Required Materials

External Storage for project files
Headphones for sound work
Pencil, sketchbook, notebook

Digital readings

All required readings will be posted to Carmen.

Carmen access

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357(HELP) and IT support staff will work out a solution with you.

General Class and Studio Policies

Writing style. Any written submissions should follow the standard English guidelines for using proper grammar, spelling, and punctuation. Informality is fine for non-academic topics.

Tone and civility. In verbal exchanges and in writing, let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online or in writing.

Citing your sources. In any written form of academic submission, please cite your sources to back up what you say and for any images you use. If you use a photograph or are particularly inspired by another work and wish to include, mimic, or apply any part of it to your work, cite it. While use of precedents (existing designs/ideas) is expected to inspire new iterations and build skills, you are expected to credit your sources. For published or online written orvisual materials, please use the **APA citation style**. If you are not accustomed to writing in APA style (which is preferred by the disciplines encompassed in this course), you can use a citation generator such as https://www.mybib.com/tools/apa-citation-generator to help you get it right.

Protecting and saving your work. Consider composing anything you submit for this course using software that allows you to save your work separately. I recommend that you copy intothe Carmen drop box for submission. Please do not submit one-of-a-kind material.

Communication tool: Carmen. Carmen (carmen.osu.edu) will be used for all communication specific to individual sections through announcements (for example: if I need to start class late or need to update you on a specific detail). Carmen will also be where all grades, readings, and lecture PDFs are posted. Assignment details will be shared on Carmen on each assignment page.

Communication tool: Email. Email through Carmen's inbox function or through your BuckeyeMail will be the only source of private and secure conversations. Information general personal matters, assignment or class inquiries or other similar topics should be addressed using these two sources.

All university correspondence is sent to your BuckeyeMail email address, and all email sent to faculty and staff should be sent from your BuckeyeMail email address.

Ohio State will never ask for your Ohio State username or password. Do not reply to any email asking for your Ohio State username, password, or other personal information. Report such messages to report-phish@osu.edu.

Communication tool: Teams. If your course makes use of Teams for file sharing or communication, describe that here. Your instructors and GTAs may allow DMing (and have notifications on at certain times) where you could contact them for clarifications or questions. However, the DM function should never be used for private information (such as grades).

Copyright for instructional materials. The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Reusing past work. In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with your instructor at the start of the assignment/project.

Artificial Intelligence and Academic Integrity. There has been a significant increase in the popularity and availability of a variety of generative artificial intelligence (AI) tools, including ChatGPT, Sudowrite and others. These tools

will help shape the future of work, research and technology but when used in the wrong way, they can stand in conflict with academic integrity at Ohio State.

All students have important obligations under the Code of Student Conduct to complete all academic and scholarly activities with fairness and honesty. Our professional students also have the responsibility to uphold the professional and ethical standards found in their respective academic honor codes. Specifically, students are not to use unauthorized assistance in the laboratory, on field work, in scholarship or on a course assignment unless such assistance has been authorized specifically by the course instructor. In addition, students are not to submit their work without acknowledging any word-for-word use and/or paraphrasing of writing, ideas or other work that is not your own. These requirements apply to all students undergraduate, graduate, and professional.

To maintain a culture of integrity and respect, these generative AI tools should not be used in the completion of course assignments unless an instructor for a given course specifically authorizes their use. Some instructors may approve of using generative AI tools in the academic setting for specific goals. However, these tools should be used only with the explicit and clear permission of each individual instructor, and then only in the ways allowed by the instructor.

Grade Forgiveness. The Grade Forgiveness Rule allows undergraduate students to petition to repeat up to three courses. The grade in the repeated course will permanently replace the original grade for the course in the calculation of the student's cumulative GPA. Only a first repeat can be used this way; all other repeats of the same course will be included under the general course repeatability rule.

The original grade will remain on the student's transcript and some graduate/professional school admission processes will re-calculate the student's GPA to include the original grade. See: https://advising.osu.edu/grade-forgiveness-0 for more information.

Grievances and Solving Problems. If you encounter a problem related to your educational program, you have a variety of avenues available to seek resolution. Typically, you are advised to resolve any dispute, disagreement, or grievance as directly as possible, engaging with the person or persons most closely involved. If this step does not produce acceptable results, you should follow a logical stepwise progression to address the academic concerns.

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with me (your instructor or professor). Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-8-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Creating an environment free from harassment, discrimination, and sexual misconduct.
The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Civil Rights Compliance Office:

Online reporting form at http://civilrights.osu.edu/,
Call 614-247-5838 or TTY 614-688-8605, Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Civil Rights Compliance Office to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.

- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Counseling and Consultation Services / Mental Health Statement. As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing.

If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th floor of the Younkin Success Center and 10th floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766 and 24-hour emergency help is also available through the 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Content Warning Language. Some content in this course may involve media that may elicit a traumatic response in some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a confidential Sexual Violence Advocate 614-267-7020, or Counseling and Consultation Services at 614-292-5766 and contacting the instructor if needed). Expectations are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class

Lyft Ride Smart. Lyft Ride at Ohio State offers eligible students discounted rides, inside the university-designated service area (opens in new window) and has expanded service to the Short North area along High Street. Service runs from 7 p.m. to 7 a.m. Prices may be impacted by distance, traffic, time of day, special events and prime time surcharges. More information about the service and the Lyft App, and a link to get started using the Lyft Ride Smart services can be found at: https://ttm.osu.edu/ride-smart.

Weather/Short-Term Closing. Although Ohio State strives to remain open to ensure continuity of services to students and the public, extreme conditions can warrant the usage of the university's Weather or Other Short-Term Closing Policy. Please visit this webpage to learn more about preparing for potential closings and planning ahead for winter weather.

Academic Policies

Academic integrity policy. Academic integrity policy. Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may

constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committee academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.
If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Intellectual Diversity. Ohio State is committed to fostering a culture of open inquiry and intellectual diversity within the classroom. This course will cover a range of information and may include discussions or debates about controversial issues, beliefs, or policies. Any such discussions and debates are intended to support understanding of the approved curriculum and relevant course objectives rather than promote any specific point of view. Students will be assessed on principles applicable to the field of study and the content covered in the course. Preparing students for citizenship includes helping them develop critical thinking skills that will allow them to reach their own conclusions regarding complex or controversial matters.

Religious Accommodations. Ohio State has had a longstanding practice of making reasonable academic accommodations for students' religious beliefs and practices in accordance with applicable law. In 2023, Ohio State updated its practice to align with new state legislation. Under this new provision, students must be in early communication with their instructors regarding any known accommodation requests for religious beliefs and practices, providing notice of specific dates for which they request alternative accommodations within 14 days after the first instructional day of the course. Instructors in turn shall not question the sincerity of a student's religious or spiritual belief system in reviewing such requests and shall keep requests for accommodations confidential.

With sufficient notice, instructors will provide students with reasonable alternative accommodations with regard to examinations and other academic requirements with respect to students' sincerely held religious beliefs and practices by allowing up to three absences each semester for the student to attend or participate in religious activities. Examples of religious accommodations can include, but are not limited to, rescheduling an exam, altering the time of a student's presentation, allowing make-up assignments to substitute for missed class work, or flexibility in due dates or research responsibilities. If concerns arise about a requested accommodation, instructors are to consult their tenure initiating unit head for assistance.

A student's request for time off shall be provided if the student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement and the student has notified their instructor, in writing during the first 14 days after the course begins, of the date of each absence. Although students are required to provide notice within the first 14 days after a course begins, instructors are strongly encouraged to work with the student to provide a reasonable accommodation if a request is made outside the notice period. A student may not be penalized for an absence approved under this policy.

If students have questions or disputes related to academic accommodations, they should contact their course instructor, and then their department or college office. For questions or to report discrimination or harassment based on religion,

individuals should contact the Civil Rights Compliance Office.

Policy: Religious Holidays, Holy Days and Observances

Accessibility accommodations for students with disabilities

All instructors are encouraged to include in their syllabus a statement inviting students with disabilities to meet with them in a confidential environment to discuss making arrangements for accommodations. There are several reasons why this syllabus statement is critical. This statement both normalizes the accommodation process and helps to create a positive and welcoming environment for students with disabilities. Also, the statement creates a collaborative vehicle for providing accommodations and serves as a reminder to students who need the accommodations that these arrangements need to be made.

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are ill and need to miss class, including if you are staying home and away from others while experiencing symptoms of viral infection or fever, please let me know immediately. In cases where illness interacts with an underlying medical condition, please consult with Student Life Disability Services to request reasonable accommodations. You can connect with them at slds@osu.edu; 614-292-3307; or slds.osu.edu.

CALENDAR

Week#	Dates	Lecture and Demo	In-class exercise	Dues
1.1	8/27	Production Pipeline, Maya interface, Asset pipeline (Modelling, Rigging, Surfacing)	1. Toy Train, Part 1	

Course notes

- Animation Production Pipeline.
- Process of making short stories
- Maya interface (Alt key, W/E/R key), workspace, orthographic/perspective camera.
- Project window/set project and project folder hierarchy.
- Create Polygon primitives to create a toy train.
- Hierarchy of geoms- object vs. shape, grouping vs. parenting.
- Freeze transformation, deleting history.
- Discuss Pivot and XYZ coordinate and world/local space.

Key terminology to research

- Reference / Export/ Import
- File Formats (FBX, OBJ, TIFF, EXR, JPG, PNG, USD)
- X, Y, Z Axis in 3D space
- World Space vs. Local Space / XYZ Coordinates
- Pivot

Recommended Reading

https://archive.org/details/99waystotellastory/page/n67/mode/2up

1.2	8/29	Hypershade, Graph Editor, Lighting, Rendering, Shots pipeline (Camera, Animation, Lighting, Rendering)	2. Toy Train, Part 2	watch chapters 1,2 (https://www.lynda.com/ 3D-Animation-tutorials/Introduction-3D/385431-2.html)

Course notes

- Use Hypershade to create materials, add colors and assign to geoms.
- Navigate timeline and animate train wheels and suspensions.
- Playblast the current animation to see the proper timing.
- Add directional light and open rendersettings to turn on raytracing shadow option.
- Open graph editor to add ease in/out.
- Render the scene and make a movie file.

Key terminology to research

- Material vs. shader vs. texture
- Keyframe, FPS

- Interpolation

Recommended Reading

https://pixune.com/blog/3d-animation-pipeline/

2.1	9/3	Polygon tools (Mesh, Edit Mesh, Mesh tools, Mesh Display)	3. Boat	Story synopsis, Reference images, Concept statement watch chapters 4, 5, 7 (https://www.lynda.com/3D-Animation-tutorials/Introduction-3D/385431-2.html)

Course notes

- Triangle vs. Quad, what is topology and how to keep the model clean.
- Vertex/edge/face and how to manipulate them.
- Bring images (side and topview) as an image plane to model upon.
- Extrude, Bevel, Merge, Bridge, Reverse Normal, Insert Edge Loop, Multi-Cut, Quad Draw, Booleans, Combine, Fill Hole, Smooth.
- Work on modelling of boat body, seats, ropes, buckets, oars, nails/parts of the boat

Key terminology to research

- Polygon vs. NURBS
- Curves
- Normal
- Component mode
- Topology, retopology, quad vs. triangle
- Subdivision surface

Recommended Watching

https://www.maxhattler.com/aanaatt/
https://linesandmarks.com/blu-muto-wall-painted-animation/
https://cdn.jwplayer.com/previews/RGtGw8Mh-dYsrOfVj

2.2	9/5	Vegetation modeling (Level of Detail)	4. Four different trees	5 panels of storyboard watch chapter 1-6 (https://www.linkedin.com/learning/maya-2022-essential-training)

Course notes

- Introduction to organic modelling.
- Different level of detail and control for 4 different trees.
- BG tree- use plane and image.
- MG tree- model trunk and small branches with plane and image.

- FG tree- model each branches and leaves.
- FGM tree- paint effects (render it in Arnold).

Key terminology to research

- Near and Far plane
- Optimizing file size and memory
- Foreground, midground, background

Recommended Reading

https://graphics.pixar.com/library/Geri/paper.pdf

3.1	9/10	cloth sim, XGen, sculpting tools, deformer, MASH	5. Café table and chair	

Course notes

- Quick cloth sim for towels, tablecloth, and curtains
- Bend tool, lattice, sculpt tools
- XGen for grass and hair
- MASH

Key terminology to research

- Dynamics
- Soft body vs. rigid body
- Deformation
- Simulation
- Cache

Recommended Reading

https://ikarus3d.com/media/3d-blog/everything-you-need-to-know-about-the-optimization-of-3d-assets/

3.2	9/13	• Critique –A1, Set modelling		
4.1	9/17	Materials, Surface quality	6. Still Life	Assignment 1 Due (entire project folder, self-evaluation, self-reflection statement)

Course notes

- What is surface? properties of surface and how to balance Kd/Ks/Kr value.
- Hypershade interface and how to work with nodes in shading network.
- Basic attributes for Lambert, Blinn, Phong E.
- Arnold aiStandardSurface, node editor to explore file node and place2dTexture nodes.
- Utility nodes and aiColorJitter node.
- Subsurface and alpha channel to create transparency.

Key terminology to research

- RGBA

- Diffuse, Specular, reflection
- Raytracing
- Shading network

Recommended Reading

https://help.autodesk.com/view/ARNOL/ENU/?guid=arnold_user_guide_ac_surface_shaders_ac_standard_surface_html

4.2	9/19	UV mapping	7. Box UV	

Course notes

- UV editor interface.
- UV toolkit.
- Camera based selection
- Camera-based UV mapping, Planar/Spherical UV mapping, keeping the grid uniformed.
- UV snapshot and work with Adobe Photoshop.

Key terminology to research

- UV, UV shell, UV coord, UV tiling

Recommended Reading

https://dreamfarmstudios.com/blog/stylized-animation-is-revolutionizing-the-industry/

5.1	9/24	Complex model UV mapping	8. ChairUV	Watch chapter 8,9 (https://www.linkedin.com/learning/maya-2022-essential-training)

Course notes

- Organic shape UV mapping.
- Sawing and stitching in UV toolkit.
- Bump maps, ramp texture.
- Optimizing texture files.

Key terminology to research

- Alpha Channel and transparency/opacity
- Bump vs. Normal vs. Displacement
- Color space (sRGB, linear)
- Gain vs. Gamma

Recommended Reading

https://blog.cg-wire.com/texturing-shading-animation/

5.2	9/26	• Critique –A2, Surfacing sets and props

6.1	10/1	Character Modelling	9. Head modelling	Assignment 2 Due (entire project folder, self-evaluation, self-reflection statement)

Course notes

- Deform and Sculpting tool.
- Symmetry modelling.
- How to integrate eyes and mouth to face.
- Texturing for Character eyeballs and face.

Key terminology to research

- Color script, Color keys
- Character Design sheet
- Turntable

Recommended Reading

https://3daily.ai/blog/creating-stylized-3d-character-the-complete-character-modeling-workflow/

6.2	10/3	Basic rigging	10. Arm	watch chapter 1 (https://www.lynda.com/Maya-tutorials/Character-Rigging-in-Maya/92564-2.html)

Course notes

- Create Joints.
- Naming convention, Hierarchy, and the orientation of the joints.
- IK handle
- Preparing a model for rigging

Key terminology to research

- IK vs. FK
- Root
- Gimbal Lock
- Euler behavior

Recommended Reading

https://discover.therookies.co/2020/06/10/complete-workflow-for-creating-a-stylized-3d-female-action-character/

7.1	10/8	IK, FK, Contraints	11-1. Boy Rigging	watch chapter 2-5 (https://www.lynda.com/Maya-tutorials/Character-Rigging-in-Maya/92564-2.html)

Course notes

- Build an entire body rig and bind the skin.
- Constraints- parent, aim (eyeballs) and pole vector (elbow and knee).
- Adding controllers.

Key terminology to research

- Pole vector

- Orientation Axis (world, local, object)
- Matrix node
- Multiply, add, subtract

Recommended Reading

https://animatorartistlife.com/learning/character-animators-guide-to-human-anatomy-for-artists/

7.2	10/10	Skin binding, Facial	11-2. Boy Rigging	watch chapter 6-7 (https://www.lynda.com/Maya-tutorials/Character-Rigging-in-Maya/92564-2.html)

Course notes

- Paint skin weight.
- Deformation (Blendshape, Cluster, Delta Mush).
- Picking up objects (switch for constraints control).

Key terminology to research

- Smooth binding vs. Rigid binding
- Skin Cluster

Recommended Reading

https://garagefarm.net/blog/understanding-topology-in-3d-modeling
https://topologyguides.com/

8.1	10/15	• Critique –A3, Rigging a character		
8.2	10/16	AUTUMN BREAK (Oct 16-17)		
9.1	10/22	Camera angle, frame, motion, cinematography,	12. Camera and layout	Assignment 3 Due (entire project folder, self-evaluation, self-reflection statement)

Course notes

- Basic cinematography lesson (long lens vs. short lens, DOF, camera framing, camera angle, camera movement)
  via “The Shining” clips.
- Camera attributes.
- Depth of field using Arnold
- Graph editor to animate camera.

Key terminology to research

- Depth of Field (DOF)
- Field of View (FOV)
- Fstop, Aperture
- Focal Length
- Aspect Ratio
- Bokeh

Recommended Reading

https://nofilmschool.com/toy-story-4-pixar-cinematography
https://www.khanacademy.org/computing/pixar/virtual-cameras

9.2	10/24	Making shots, playblasts	13. Setdressing and creating scenes	watch chapter 1-5 (https://www.lynda.com/Maya-tutorials/Cinematography-Maya/150001-2.html)

Course notes

- Continue on the exercise.
- Playblasts.
- Creating MainCam for each shot and set renderingsettings.
- Importing/exporting assets.
- Address the props to creates Mise-en-Scene.

Key terminology to research

- Mise-en-Scene
- setdressing
- Cinematographer
- Director of Photography

Recommended Reading

https://www.studiobinder.com/blog/mise-en-scene/

10.1	10/29	• Critique –A4, Layout and Setdressing

10.2	10/31	Principles of animation, simple keyframing, graph editor	14. Bouncing ball	Assignment 4 Due (playblast movies, self-evaluation, self-reflection statement)

Course notes

- Review of Principles of Animation.
- Graph editor, different tangent/breaking tangents
- Basic cycle animation using curves and offsetting the curves. (Post infinity)
- Pose to pose animation.

Key terminology to research

- tweening
- Inbetween vs pose-to-pose
- Staging
- Follow through

Recommended Watching

https://www.youtube.com/watch?v=VrFhQcmM0nw

11.1	11/5	Lattice animation, animating materials and lighting	15. Two walk cycles	chapter 11 (https://www.linkedin.com/learning/maya-2022-essential-training)

Course notes

- Mechanical schematics of two walk cycle- simple and more details.
- Copying and pasting keyframes on timeline

Key terminology to research

- Ease in and Ease out
- Tangent (spline, linear, flat)

Recommended Reading

https://www.schoolofmotion.com/blog/walk-cycle-inspiration

11.2	11/7	Q&A, Workday		
12.1	11/12	• Critique –A5, Animation		
12.2	11/14	Lighting techniques	16. Lighting an orange	Assignment 5 Due (playblast movies, blocking for all shots done)

Course notes

- 3-point lighting (key, fill, kick, bounce, and rim light).
- Directional, point, spot, and ambient lights, Fog, and special effects lights.
- Depth map shadow vs. Raytrace shadow.
- Light linking.

Key terminology to research

- Decay, Falloff, Shadow bias
- Max bounce
- Indirect lighting
- Caustics
- Wedge Test

Recommended Reading

https://dreamfarmstudios.com/blog/the-ultimate-guide-to-lighting-fundamentals-for-3d/

13.1	11/19	Lighting Principles	17. Lighting Primitives	self-evaluation, self-reflection statement)

Course notes

- Digital Cinematography- what are the objectives in lighting.
- Arnold lighting- Area, Dome, and Mesh lights.
- Atmosphere and fog.
- Visibility and Light filters/blockers and Decay.

Key terminology to research

- Physically based Rendering (PBR)
- HDRI
- Global Illumination
- Photon
- Chromatic Aberration (Color fringing)

Recommended Reading

https://help.autodesk.com/view/ARNOL/ENU/?guid=arnold_user_guide_ac_lights_ac_area_light_html

13.2	11/21	Lighting sets and chars	17. Lighting Sets and Chars	Watch chapter 10 (https://www.linkedin.com/learning/maya-2022-essential-training)

Course notes

- Set lighting interior and exterior
- Character lighting
- Light rigs to import and export.
- How to balance between set and character lighting.
- Shaping a face and lighting eyes and teeth and mouth.
- Believability vs reality.
- Rendering and optimizing (sample rates).
- Render settings.

Key terminology to research

- Volumetric lighting
- AOV
- Image Resolution
- Ambient occlusion
- Z depth
- Compositing
- LUT

Recommended Reading

https://www.chaos.com/blog/what-is-pbr-physically-based-rendering-a-complete-guide?srsltid=AfmBOorajHzjIujz3-8Ny5fRJOCmDaBgrFK5I3bMXuPu0pWWH8zM73z_

https://www.studiobinder.com/blog/what-is-compositing-definition/

14.1	11/26	Thanksgiving		
14.2	11/28	Thanksgiving		
15.1	12/3	• Critique –A6, Lighting		
15.2	12/5	Rendersetting Renderfarm AE/Premiere	19. Motion blur, DOF	Assignment 6 Due (FML renders, self-evaluation, self-reflection statement)

			20. Titles and credits	

Course notes

- Run through the whole pipeline from modelling to rendering and submit a batch render.
- Import images to Adobe AE/Premiere and add sound/credit/title and export it to a movie.
- Optimize and debug rendering using debug tool in Arnold.
- Motion blur and Depth of Field in Arnold.
- Submitting rendering using Renderfarm via Deadline monitor.

Key terminology to research

- Antialiasing, Denoising
- Samples
- Motion blur
- Beauty pass, render layer, channel

Recommended Reading

https://www.autodesk.com/support/technical/article/caas/sfdcarticles/sfdcarticles/How-to-improve-render-times-with-Arnold-and-Maya.html

16.1	12/10	Q&A, Workday		
16.2	12/15 MON 4PM	• Critique –A7, Rendering • FINAL PRESENTATION • Assignment A7 Due (the entire movie with credits and title, self-evaluation, and self-reflection statement)		

https://www.schoolofmotion.com/blog/3d-motion-design-glossary