

Digital Design: Simulated Environments

Fall 2025

Class: Tuesday 6:00PM – 8:50PM

Instructor: Gaberiel Shaferman

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Description:

The course will introduce students to the language and conventions of manipulating tools and techniques in virtual filmmaking to develop and create simulated environments.

Objectives:

Provide an exposure to environment development & simulated aesthetics. Develop a creative direction methodology for digital world creation. To develop a sense of quality of craft with simulated environment making and design.

Class Policies:

Assignments are due at the beginning of class. Assignments that are not clearly labeled will not be accepted or graded. Late work will be graded down one letter grade for every class late. All preliminary and final work must be uploaded to Canvas for presentations and grading.

Students who do not complete and submit assignments on time and to a satisfactory standard will fail the class. It is the student's responsibility to obtain missed assignments from other classmates and make up work in time for the next class.

*Cell phones, and non-course related internet usage will not be used during class.

Resources:

Substance Resources 2024: (13000+ materials)

<https://drive.google.com/drive/folders/13ssgXmt4P4Y1UIw8SN6iPLaWBuzSQM7r?usp=sharing>

Academic Integrity

Upholding academic integrity is a commitment to the pillars of honesty, trust, fairness, respect, responsibility, and courage.

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree to which you are working. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found in the [NJIT Academic Integrity Code](#).

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing, or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the Code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

Withdraw

Students sometimes need to withdraw from a class due to personal or academic reasons. Click [here](#) for deadline dates.

If you do encounter difficulties, please contact me before withdrawing.

Digital Design Submission Requirements:

SIGGRAPH's annual conference includes the Faculty Submitted Student Work Exhibit. This is a double-curated exhibit seen by many professionals at the biggest computer graphics conference. Submitted work must be conceived, designed, and created by the student. While using the latest tools to enhance a design or speed a process is encouraged, the focus of any visual narrative must be original. Should their work be accepted, students can add this accomplishment to their résumé and include the selection laurels in their portfolio. To have their work considered, students must complete and return a signed version of the provided FERPA form ([download link here](#)). Final work must also be at HD resolution (16:9): 1280 x 720 or 1920 x 1080.

Software:

Maya - Modeling and UV Unwrapping
Adobe Substance 3D Painter - Texturing
Unreal Engine - Building and Rendering
After Effects - Final Edits and Sound

Grading:

A. Ability to intellectually engage the material investigated in the course. Students are to thoughtfully engage the material presented in readings, presentations and discussions. Responses to questions should be directly and thoughtful related to topics investigated in the assignment.

B. Communication. The ability to communicate ideas and concepts to others. This includes written, verbal, and visual communication skills. Outside critics will be brought in at the end of some projects to review your work in an open forum environment. These presentations should be considered "client presentations" and should be presented with a level of professionalism consistent with your work.

C. Independent thinking. Independent thinking will be evaluated and will be based on the ideas and thoughts developed on an independent basis by the student. Depth of creative thought is primary to the independent thinking evaluation. Independent thinking must be clearly demonstrated in all aspects of the course including verbal participation in the classroom.

D. Professional Attitude. Students are to express and articulate clearly their view toward the topics in this course in a method that reflects the quality of a professional in the field of design. It is the ethical responsibility of the student to support the learning community in this course in a positive and constructive manner. Professional attitude includes the ability to receive and give critical feedback, respond to challenging situations with a positive attitude, and support an excellent working studio environment are all essential to receiving high marks in professional attitude evaluations.

10% - Participation

90% - 6 Assignments (15% each)

Attendance/Accommodations:

IF YOU ARE SICK, PLEASE STAY HOME. Students are responsible for letting instructors know of their absence and making up the work. Absences for illness in order to be excused MUST be accompanied by documentation from professional medical personnel who are NOT members of your family. Since religious holidays are known in advance, students who expect to be absent due to religious holidays must notify their instructor by the second week of class.

Students with either freshman or sophomore standing also have an attendance requirement overlaid on the grading criteria. No more than three unexcused absences are permitted without a grade reduction. Each unexcused absence above the three (starting with the fourth) will result in a grade reduction of .5 for the semester. In other words, four absences would result in a maximum grade of B+ (assuming everything done is of "A" quality), five absences would result in a maximum grade of "B", six in a maximum grade of "C+", etc. Students do NOT receive extensions for submission of work due to any unexcused absences. Acceptance of late work is at the discretion of the individual instructor. NJIT and instructors will endeavor to make any accommodations required and necessary for the success of students with disabilities. However, in order to receive accommodations disabilities MUST be documented with the NJIT Disability Office AND notification of request for accommodation must be made to the instructor by the second week of class. No accommodations can be granted "after the fact" unless due to a situation (injury/illness/etc.) that occurs or is documented during the semester. In those instances accommodations will commence upon notification or observation of the disability.

Class Overview:

Sept. 2nd - Assignment 1: Pre-Production

The main focus of this assignment is to research and understand specific shots from films and to use them for creating your own shot. How a shot is framed, how the camera moves, and things that take place within the shot are all essential for picking out a "reference shot". This shot must invoke a feeling, mood, or an idea. You will use the techniques in your "reference shot" to support the feeling, mood, or idea that you are going for.

Submissions:

- 1) 1 short description of the shot you're trying to achieve.
- 2) 1 short shot from a film or storyboard/sketches.
- 3) 10+ reference images of the environment/props.

Sept. 9th - Assignment 2: The Focus

Assignment 1 due.

For this assignment, you must use your references to create your primary object(s) of focus. The object(s) should be created in high-poly to capture detailed forms, then smoothed and exported as an FBX. You will texture and render them in Substance 3D Painter.

Submissions:

- 1) 3 renders per object in Substance 3D Painter
- 2) Final Maya scene

Oct. 7th - Assignment 3: The Environment

Assignment 2 due.

During this assignment, you will learn to navigate Unreal Engine, including Landscape Mode, Foliage Mode, the Quixel Bridge, and the Fab marketplace for sourcing high-quality assets. These tools will be used to build the environment after you import the object(s) of focus and set up a camera. Keep in mind that you must build only what the camera will see.

Submissions:

- 1) 3-5 high res screenshots in Unreal Engine 5
- 2) 1 high res screenshot from the camera view

Oct. 28th - Assignment 4: The Lighting

Assignment 3 due.

In this assignment, you will take your scene to the next level with lighting and post-processing. Creating the proper mood will require you to study how lighting works in Unreal Engine and how it affects different types of renderers. You will then implement a lighting style that supports the mood and visual narrative of your environment.

In addition to lighting, you will apply post-processing techniques such as color grading, exposure adjustments, bloom, depth of field, and ambient occlusion to enhance the cinematic quality of your scene. Post-processing should not be an afterthought, it must be integrated intentionally to reinforce atmosphere, focus, and storytelling.

Submissions:

- 1) 3-5 Updated high res screenshots in Unreal Engine 5
- 2) 1 Updated high res screenshot from the camera view

Nov. 11th - Assignment 5: The Animation

Assignment 4 due.

Time to breathe life into your project with animations. You will create animations directly in Unreal Engine using transform animations, keyframing, and Sequencer tools to add movement and flow to your environment. This can include subtle foliage animations (if they support your landscape), wind simulations, moving props, and environmental effects that enhance your scene's mood and narrative.

Once assets are animated, you will develop cinematic camera movement in Unreal Engine using the Sequencer. Camera paths should be intentional by directing the viewer's focus, revealing key details, and reinforcing the scene's atmosphere.

Submissions:

- 1) 3-5 Updated High res screenshots in Unreal Engine 5
- 2) 10-12 seconds of Deferred camera render

Nov. 18th - Assignment 6: Final Render

Assignment 5 due.

Finally, the project will be ready to be rendered using the Movie Render Queue. This assignment gives you time to set up your project for the highest-quality output, including the use of console variables for fine-tuning. Once the render is complete, you will bring your project into After Effects for final adjustments, such as minor visual tweaks or sound edits.

https://dev.epicgames.com/documentation/en-us/unreal-engine/rendering-high-quality-frames-with-movie-render-queue-in-unreal-engine?application_version=5.4

Submissions:

- 1) 10-12 seconds Render.

Dec. 2nd - Final