

# DM-UY 4913/K Virtual Enhancement



**NYU**

**TANDON SCHOOL  
OF ENGINEERING**

**Integrated Digital Media • Technology, Culture & Society Department**

B. Edan McDevitt • edan@nyu.edu • Fall 2023

Fridays • 10:00AM - 11:50AM; 12PM - 1:50PM

Office hours by appointment • <https://calendly.com/edanmcdevitt/virtual-enhancements-1-on-1>

Phone: 630 408 1093

## Welcome to Virtual Enhancement

This course will cover topics in 3D, rendering, motion and interaction design with a focus on visual polish & finishing. Students will learn advanced methods in node-based render engines, shader design, lighting, motion, and post-processing in order to bring the visual fidelity of their projects to a professional level.

### PROGRAM GOALS

The following IDM program goals are reinforced within this course. Students will:

- Develop conceptual thinking skills to generate ideas and content in order to solve problems or create opportunities.
- Develop technical skills to realize their ideas.

- Develop critical thinking skills that will allow them to analyze and position their work within cultural, historic, aesthetic, economic, and technological contexts.
- Develop collaboration skills to actively and effectively work in a team or group

## COURSE GOALS

This course will help students to:

- Refine their process in 3D design
- Understand the physics behind pre-rendered and real-time 3D systems
- Make informed decisions about fidelity and iteration in a 3D design process
- Improve their LookDev methodology

## LEARNING OUTCOMES

By the end of the course, students will be able to:

- Design, light and render 3D scenes at professional fidelity
- Use a node-based shader graph
- Design environments both static and interactive in Cinema 4D and Unreal Engine
- Iterate designs and incorporate feedback from peers

## COURSE STRUCTURE

**This course will consist of lectures, critiques, discussions, demos, exercises, weekly assignments, a midterm project and a final project**

Topics and techniques covered in the course will include:

- LookDev, material and scene design
- Post-processing and visual refinement of designed assets
- Visual effects and physics simulation
- Project planning and presentation

**All-class, small group, and 1-on-1 critiques will take place throughout the course. These sessions are the best way to articulate your ideas to others and get feedback to improve your work.**

When providing critique:

- Use constructive language; don't insult or demean projects but tell your peer what is or isn't working
- Be specific! Avoid sweeping statements like "I like this" or "this is great". Instead, tell them what you like about it and why

When receiving critique:

- Don't take it personally! Critique is an opportunity for growth and not an attack on you as a person
- Take notes and do not edit the responses

Reflect after the critique on what was said, what resonated with you, and what you disagree with.

## **Required Materials**

A computer capable of running the following programs:

- Maxon Cinema 4D & Redshift
- SideFX Houdini
- Adobe Creative Cloud incl. Photoshop, After Effects & Illustrator
- Unreal Engine 5
- Google Docs & Drive

If you find yourself in need of additional render power, the IDM XR Lab offers powerful workstations for use on your high-fidelity renders for major projects

## **COMMUNICATION**

We will be using Discord as a primary means of out-of-class communication. Find an invite to the class channel linked below:

<https://discord.gg/Cgah4kVT>

Or, put an appointment on my calendly:

<https://calendly.com/edanmcdevitt/virtual-enhancements-1-on-1>

For anything else, feel free to reach out to me at [edan@nyu.edu](mailto:edan@nyu.edu)

## EVALUATION & GRADING

### Attendance

- Attendance is mandatory and will be taken at the beginning of every class.
- Unexcused absences will affect your grade. One absence is allowed; after that your final, overall, numerical grade will drop by 5 percent ( $\frac{1}{2}$  a grade point, e.g. A to A-) for each additional absence. Per NYU policy, any excused absences need to be validated by Student Advocacy and Compliance for NYU Tandon School of Engineering ([eng.studentadvocate@nyu.edu](mailto:eng.studentadvocate@nyu.edu)) and have them notify the professor. If an excused absence is required for a religious observance, students need to contact Student Affairs at the beginning of the semester and have the professor notified.
- Be on Time. Tardiness will affect your grade. For every 15 minutes of tardiness, your final, numerical grade will drop by 0.625 percent
- Contact the professor IN ADVANCE if you will not be in class (via email, discord message, or otherwise)
- Unless you have received permission to study remotely at the beginning of the semester, you are expected to attend class in-person at 370 Jay St.

**Your final grade will be based on a synthesis of quantitative and qualitative rubrics:**

- Makeup assignments are only available when discussed with and approved by the instructor in advance of the due date
- Each student will be judged on the commitment, fearlessness and continuous improvement that their work shows. Incomplete or unsatisfactory work will receive a failing grade

## GRADING OVERVIEW

### Quantitative Grading Overview

- 20% Participation and Attendance
- 25% Assignments
- 25% Project 1

- 30% Final Project

### **Qualitative Grading Overview**

You will be judged on the quality, relevance, iteration, completion, and presentation of your work.

- A Excellent (Work of exceptional quality; Exceeds Expectations)
- A- Very Good (Work of high quality)
- B+ Good (Solid work; Meets Expectations)
- B Satisfactory (Good work; Satisfies course requirements)
- B- Needs Improvement (Below average work)
- C+ Poor Work (Well Below Average)
- C Inadequate (Less than adequate work)
- D Poor / Below Average (Work is inadequate or does not meet requirements)
- F Unacceptable (The performance and/or attendance of the student has failed course requirements.)

## **ACADEMIC HONESTY**

Please review [NYU's School of Engineering's academic dishonesty policy](#) in its entirety.

NYU School of Engineering Policies and Procedures on Academic Misconduct (from the School of Engineering Student Code of Conduct)

Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School's rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School's Policy on Academic Misconduct.

Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic

work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

**Cheating:** intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person's work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.

**Fabrication:** including but not limited to, falsifying experimental data and/or citations.

**Plagiarism:** intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.

**Unauthorized collaboration:** working together on work that was meant to be done individually.

**Duplicating work:** presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.

**Forgery:** altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.

Access the entire School of Engineering Student Code of Conduct here:  
[engineering.nyu.edu/academics/code-of-conduct](http://engineering.nyu.edu/academics/code-of-conduct)

## **TECHNOLOGY USE IN THE CLASSROOM**

Laptop computers and other mobile devices are invaluable tools for students when used responsibly. However, this technology can also be incredibly distracting in the classroom. When in class, you may use your laptops and other devices for any activities pertaining to the course: taking notes, researching material, discussions, making class presentations, etc. However, the following uses are unacceptable: checking email, instant messaging, texting, using social networking sites such as Facebook, Instagram, etc. When your classmates are presenting, please close your laptops and turn off your

cell phones. Do not take or post images of classmates' work under any circumstances, unless you have their express permission.

## **ACADEMIC ACCOMMODATIONS**

### Moses Statement

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities at 1-212-998-4980 or [mosescsd@nyu.edu](mailto:mosescsd@nyu.edu). You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at [www.nyu.edu/csd](http://www.nyu.edu/csd). The Moses Center is located at 726 Broadway on the 2nd floor.

## **STATEMENT ON INCLUSION**

The NYU Tandon School values an inclusive and equitable environment for all our students. I hope to foster a sense of community in this class and consider it a place where individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations, and abilities will be treated with respect. It is my intent that all students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. If this standard is not being upheld, please feel free to speak with me.

# COURSE OUTLINE

## Week 1

09/08

Introduction & syllabus overview

Discussion: Virtual Enhancement - How to make digital things look good

Demo: Light, Material & Fidelity in C4D & Redshift

### **Assignment:**

Install Cinema 4D & Redshift. If you are using C4D for the first time, begin looking through the tutorials at Cineversity, linked here:

[https://www.cineversity.com/vidplaylist/getting\\_started\\_with\\_cinema\\_4d\\_r20](https://www.cineversity.com/vidplaylist/getting_started_with_cinema_4d_r20)

If you are new to Redshift, find a first look tutorial attached:

<https://www.youtube.com/watch?v=NhkFn15sk7o>

### **Render Re-Work:**

Download the assets for Assignment 1 from the class Drive.

Compose & render 3 images as described in the assignment prompt

Deliver your images to the class Drive under "Assignment 1 / Delivery / Your Name" before class on 09/15 (next week)

## Week 2

09/15

Crit: Render Re-work

Discussion: Composition, Layout, and Cameras

Demo: Hi-Fi Texturing with Redshift and Substance Designer

**Assignment:** Enhance your render based on feedback and discussion in class. Upload to Class Drive under "Assignment 2 / Delivery / Your Name"



## Week 3

09/22

Crit: Render Enhancement

Discussion: Multi-Pass rendering for Post-Production

Demo: Redshift AOVs

**Assignment:** Take your favorite render from last week's assignment and enhance it with post-production techniques shown in class (or any others you know!) Deliver to the Class Drive including working files.

## Week 4

09/29

Crit: Renders, post-post

Guest Lecture:

Retouching & Enhancement in Photoshop with Shamis McGillan [@monar.x](#)

Compositing & Visual Effects with Mackenzie Krueger

**Assignment:** Download the provided models from the Class Drive and follow the prompt included. Deliver your final assets to the Class Drive.

## Week 5

10/06

Crit: Multi-pass renders

Discussion: Animation & Post-processing with After Effects

Guest Lecturer: Teresa Yang <https://teresayang.co/>

### **Assignment:**

Midterm Project Brief. Write a 1-paragraph brief of your midterm project's goals, how you intend to achieve them, and the tools you will use based on the project prompts given.

Midterm Moodboard: Following your Midterm Brief, construct a moodboard of at least 15 examples of aesthetic, material, functional, or other types of inspiration. Upload your moodboard to the class drive for discussion

## Week 6

10/13

Discussion: Motion in offline 3D

Demo: Animation in C4D and Motion Post-processing

1-on-1 Midterm Meetings

**Assignment:** Work on your midterm project according to your own timeline. Be prepared for a short 1-on-1 meeting to discuss your progress & ask questions.

## Week 7

10/20

Discussion: Real-Time Rendering with Unreal Engine

Demo: Unreal workflow for rendering

Guest Lecture: VFX for Film: Pipeline & More with Casey Judge

**Assignment:** Work on your midterm project according to your own timeline. Be prepared for a short 1-on-1 meeting to discuss your progress & ask questions.

## Week 8

10/27

Midterm Project Presentations & Critique

**Assignment:** Get some rest! Your midterm is done.

## Week 9

11/03

Discussion: Particles & Other Forms of Juice

Demo: Particle systems

Final Project Brainstorming Session

**Assignment:**

Final Project Brief. Write a 1-paragraph brief of your final project's goals, how you intend to achieve them, and the tools you will use based on the project prompts given.

Final Project Timeline: Create a timeline for your final project.

Final Moodboard: Following your Final Project Brief, construct a moodboard of at least 15 examples of aesthetic, material, functional, or other types of inspiration. Upload your moodboard to the class drive for discussion

**Week 10**

11/10

Discussion: Volumes & Fractures

Demo: Volume simulation & rendering in Houdini, Embergen & Redshift

**Assignment:** Continue work on your final project according to your project timeline.

**Week 11**

11/17

Discussion: Real-time 3D for AR

Demo: 3D Pipeline for Tiktok & Spark

**Assignment:** Continue work on your final project according to your project timeline.

**Week 12**

11/24

Thanksgiving Break - No Class

**Week 13**

12/01

Discussion: TBD

**Assignment:**

## **Week 14**

12/08

Discussion: Presentation & Process Documentation

**Assignment:** Finalize your project & presentation. Upload your presentation and relevant files to the class drive before class next week

## **Week 15**

12/15

Final project presentation

**Assignment:** Revise your project & presentation based on the critique you received. All projects must be submitted on Drive by 11:59PM on Dec 22, 2023