**DIGITAL CLOWNS**                                      **AD 490-101**
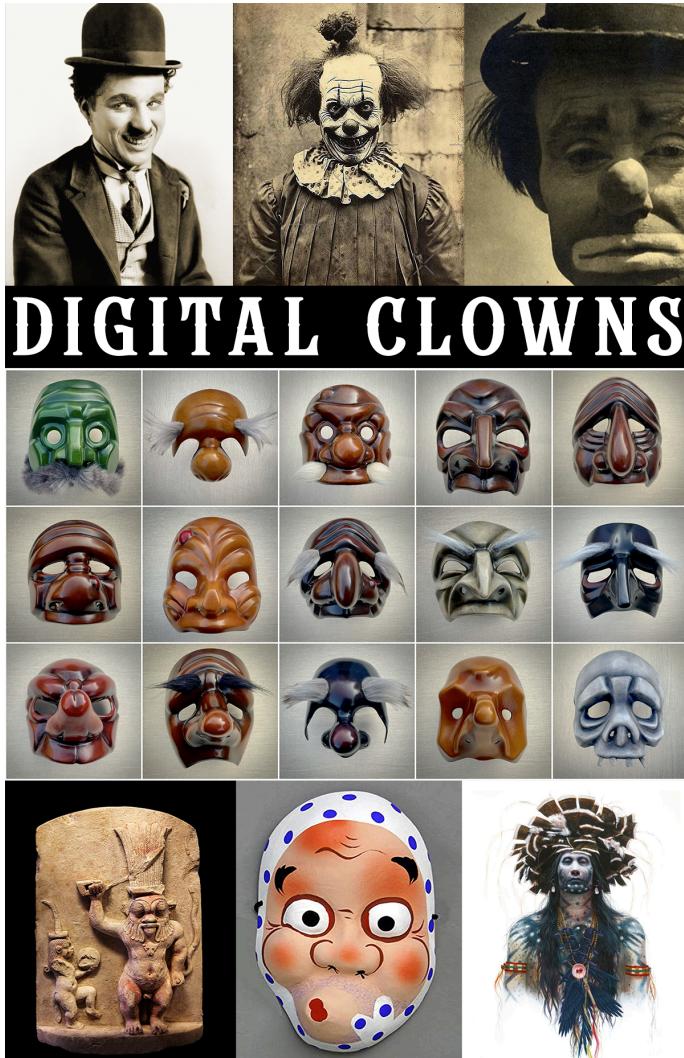


*"The tools are available as never before to bring your vision to life. That is **the magic moment**. Give life to a work of art and it's a great feeling, a special feeling, a feeling that money can't buy."*
— Morgan Kelly
(Dreamworks)

*"The really best acting (for motion capture) is **children in a playground** or in a backyard. They're just lost in their imagination."*
— Nolan North (voice actor)

*"That's the beauty of motion capture. It requires that **commitment to a character**…"*
— Medium (medium.com)

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| Class meets on:<br>Tuesdays 6 PM – 8:50 PM<br>Room: 236H (Animation lab)<br><br>Prerequisites:<br>DD 264 | Instructor: Richard Thompson<br>Pronoun: He/Him/His<br>Email: richard.thompson@njit.edu<br><br>Office Hours:<br>Tuesdays 3:30 PM – 5:30 PM<br>Rm 101, The Idea Factory – Cypress Hall<br>(and by appointment) |

## What is this course about?

This course focuses on bringing virtual characters to life, visual storytelling through animation, and the interrelation between clowning and digital character performance. Topics to be covered include (but are not limited to):

- *Stylized Character Design*:
    - Design that prioritizes personality, function, and story.
    - Best practices for mesh topology for rigging and animation.
    - Exploration of stylized design aesthetics, including simplicity, exaggeration, and clarity.
    - Understanding how shapes, distinct silhouettes, and proportions influence a character's appeal and personality.
    - Experiment with powerful texturing tools to tell a story with economy and precision.
- *Biped Rigging*:
    - Basic set-up and naming conventions for Maya's HIK and Flow Studio's motion capture system.
    - Development of skills for creating emotive facial shapes for animation.
- *Motion Capture*:
    - Capture using Flow Studio, a markerless AI-driven MoCap system.
    - Understand workflow and best practices for video capture, processing, transfer, and retargeting data onto a custom character rig.
- *Character Animation*:
    - Focus on crafting compelling stories using character motion.
    - Animate characters reacting to their environmental stimuli to build context and engagement.
    - Learn how to communicate a character's personality through amplified poses, gestures, and movement.
    - Explore how exaggeration can emphasize emotion, weight, and intention.
    - Understand the role of timing in creating distinct character behaviors.
    - Practice simplifying movements to maintain clarity in complex animations.
    - Identify MoCap acting techniques for best end results.
    - Draw inspiration from clowns to develop movement that engages, immerses, and connects emotionally, whether for laughs or tears.

## What can I expect to learn?

Learning objectives:

*Technical*

1. **Understand** the role of motion capture in broader production pipelines.
2. **Examine** emerging trends and technologies in motion capture and animation.
3. **Explain** the differences between marker-based and AI-driven markerless motion capture, including strengths, limitations, and applications.
4. **Demonstrate** session workflows, setting up, calibrating, and operating an AI-powered MoCap system to capture and preprocess human movement.
5. **Transfer and retarget** captured motion data to custom 3D character rigs, integrating hand-keyed animations for stylized effects.
6. **Diagnose and resolve** common technical issues (e.g., jitter, occlusion, latency) in AI-enhanced motion data.
7. **Integrate** AI-driven tools for adaptive rigging and automatic retargeting across different body proportions.
8. **Evaluate** the fidelity and expressive quality of AI-generated motion data compared to traditional MoCap methods.

*Design*

1. **Explore** the interrelation between clowning, performance, and character animation.
2. **Design and develop** a stylized, motion-capture-ready digital character.
3. **Produce** expressive storyboards or action sequences to guide animation.
4. **Create** an original project integrating AI-driven MoCap into a creative or technical workflow.
5. **Develop** animated sequences that convey character personality, intent, and emotional authenticity.
6. **Analyze** the relationship between motion and emotion in character animation.
7. **Evaluate** motion capture animations for authenticity, performance quality, and expressive impact.
8. **Iterate and present** a refined prototype, performance, or interactive piece that demonstrates creative application of AI-driven MoCap.

# What book and other materials do I need?

Required Software:

If necessary, make a new account or access your account, provide proof of student status, and download the **free** academic versions (*not* the "trial" versions) of:

- **Autodesk Maya** (2026): https://www.autodesk.com/education/students
- **Adobe Substance 3D Painte**r: https://substance3d.adobe.com/education/
- **Autodesk Flow Studio**: https://www.autodesk.com/products/flow-studio/ (provided by NJIT/HCAD)
- **Adobe CC**: (Photoshop, Premiere, Media Encoder, After Effects) (provided by NJIT/HCAD)

Substance Resources: 13000+ Substance Materials
https://drive.google.com/drive/folders/13ssgXmt4P4Y1UIw8SN6iPLaWBuzSQM7r?usp=sharing

Discord Link: https://discord.gg/ZXEA3tswJU

Other:

- Students are *required* to back up their work at all times. "Losing" files is avoidable. Having a "corrupt" file, while unfortunate, is a very real occurrence when working in this field. So be forewarned: it is not an excuse for tardy assignments. Save often, save *incremental* versions, and back up your work!
- (Digital) Sketchpad, pen, and pencils – sketches and mood boards are a vital part of any brainstorming and iterative design.
- Peer instruction from fellow students.

Recommended (but not required):

*The Animator's Survival Kit*
Richard Williams
ISBN-13: 978-0571202287
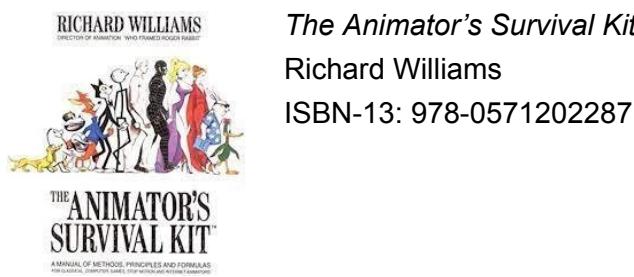
## How will my work be graded?

Diligent, *timely* work is essential. You must put thought, effort, and care into your assignments to be successful. It will be apparent if you have rushed your work.

When contacting the professor for help, *always* include/attach the most recent scene file and explain your issue. If a Vimeo tutorial is unclear, please note the video number and the moment on the timeline when things became confusing. However, do not expect the professor to respond to requests made the night before a project is due. At that point, if you cannot solve the issue on your own, you must take the late grade deduction to submit completed work.

Students are required to make productive use of lab time. You are also expected to put in a base number of hours of work each week *outside* of class time. To this end, students will show and report their progress. However, simply "doing *some* work" does not entitle you to pass the class (let alone achieve a particular grade). Technical skill, aesthetic quality, and demonstrating that you have met *all* the learning goals are integral.

Attendance is an explicitly mandatory component of ALL on-campus/location-based classes for ALL students in the School of Art + Design. For this course, the penalty is: after three unexcused absences, students may be docked one-half grade for each subsequent unexcused absence (see [Attendance](#)). Missed classes will negatively impact a student's work, progress, and final grade. So will lateness or partial attendance at any class. Early departure(s) from, or late arrival(s) to class will automatically count as ⅓ of an unexcused absence. Above 30 minutes will be considered equal to ½ of an unexcused absence. Absences that cover more than half of the class meeting will be calculated as full unexcused absences.

If you are absent, it is *your* responsibility to catch up *promptly* with the class by reviewing pertinent Vimeo demos and/or requesting classmates to review the material with you. Do *not* expect the instructor to repeat the demonstrations and lectures you missed or spend hours tutoring you privately. Be sure, however, to ask for any handouts or assignments you may have missed.

**If you find that you are stuck and not progressing, please speak to me *right away*.**

Evaluation and grades are determined based on the following considerations:

| Grade weight | Grading scheme |
|---|---|

**Grade weight**

Assignment 1: 10%
Assignment 2: 25%
Assignment 3: 20%
Assignment 4: 35%
Professionalism / Participation*: 10%


Total: 100%

**Grading scheme**

A = 93-100%
B+ = 87-93%
B = 80-87%
C+ = 75-80%
C = 70-75%
D = 60-70%
F = below 60%

\* Professionalism / Participation refers to the degree of seriousness, immersion, and commitment you bring to your work. It includes timely attendance, meeting assignment deadlines, participating in class critiques, remaining engaged at all times, and contributing constructively to a safe learning atmosphere. It also includes any in-class assignments.

By its very nature, professionalism includes:
1. Consistently meeting deadlines.
2. Submitting completed work.
3. General time management (including constructive use of in-studio lab hours).
4. Commencing work on a project as soon as it is assigned.
5. Demonstrating progress in each class.
6. Seeking feedback on your work to incorporate needed adjustments and improvements.
7. Following instructions *promptly*.
8. Attendance at all classes – on time and until the scheduled end time.
9. Timely, if not redoubled, effort to catch up on any missed instruction.
10. Demonstrating leadership, cooperation with others, and providing constructive feedback to your peers.

Each assignment/project will be evaluated using the following criteria:

- Planning & Research
- Creativity & initiative
- Technical complexity
- Technical quality
- Artistic merit
- Adherence to project guidelines

A full and detailed rubric will be provided with each assignment.

Values of quality, aesthetics, taste, etc., are based upon the instructor's judgment of the work produced, the effort employed, and the total result achieved – as well as progress throughout the semester.

To receive full credit, all assignments/projects are due on time. Most often, submissions will be accepted up to one class meeting after the due date for a reduced letter grade. Work handed in after that will not be accepted and will be worthy of a zero for that assignment. However, do not submit an incomplete project at the original deadline. Always take the late grade and complete the requirements – or fulfill as much as you are able.

Digital Design Submission Requirements & Portfolio Considerations:
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. Final work must also be at HD resolution (16:9): 1280 x 720 or 1920 x 1080.

Be respectful to all

I intend for students from all backgrounds and perspectives to be well-served by this course. The diversity students bring to this class is an asset. Your suggestions are encouraged and appreciated.

In this studio, there are many opportunities for lively discussions and debates. However, there is no place for rude or derogatory remarks. When you speak, you must speak respectfully of all people – including your peers and your instructor.

Your peer's work/efforts are neither "good" nor "bad". Also, whether you "like" or "dislike" their work is – frankly – irrelevant. We must focus solely on whether a particular design "works" or "does not work". The only valid exclamations are yes, no, and WOW! And no matter which one of these we choose, we must then try to define *why*.

## I want you to succeed!

Yes! I want each of you to be successful in this class. I want you to make work that inspires you and your peers. I want you to push me and the other students to find new ways of approaching the materials and the tools we are using. I want you to emerge as an innovative and creative digital design artist. I am here to support you in these goals. If you have any questions, whether small or large, technical or conceptual, please speak to me.

I can also make an appointment to meet with you at a time – outside of class and office hours – that is more convenient for you. Please do not hesitate to contact me if you are having trouble or need help.

Students with documented disabilities should inform the instructor during the first week of the semester to receive appropriate accommodations. Any chronic/permanent disability for which accommodations may be required – whether taken or not by the student – must be documented with, and confirmed by, the NJIT Office of Student Disability Services. (Students are not required to avail themselves of any accommodations to which they are entitled.) Temporary disabilities that are obvious (e.g., broken arm) may be assessed by the instructor but should still be documented with the Dean of Students. Accommodations sought after the start of the semester will only be offered to students in those instances where the disabilities are diagnosed or have their first instance of occurrence during the semester. No retroactive accommodations are available.

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 you are working on. 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 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

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.

(Subject to change)

| Date | Proposed Class Schedule | Due |
|---|---|---|
| Tuesday, September 2 | Syllabus<br>Animation Short<br>Stylized Biped Design<br>A1: Pre-production & Design | |
| Tuesday, September 9 | Pre-production and Design: Feedback<br>A2: Modeling & Texturing | A1: Stylized Biped Design |
| Tuesday, September 16 | Modeling and Texturing | |
| Tuesday, September 23 | Modeling and Texturing | |
| Tuesday, September 30 | Modeling and Texturing | |
| Tuesday, October 7 | Modeling and Texturing<br>A3: Rigging for Mocap | A2: Modeling & Texturing |
| Tuesday, October 14 | Modeling and Texturing: Feedback<br>Rigging for Mocap | |
| Tuesday, October 21 | Rigging for Mocap | |
| Tuesday, October 28 | Rigging for Mocap<br>[Test out on Motion Maker]<br>A4: Mocap Retargeting & Animation<br>Flow Studio: session workflow | A3: Body Rigging for Mocap |
| Tuesday, November 4 | Flow Studio: session workflow<br>Mocap Retargeting | |
| Tuesday, November 11 | Mocap Retargeting | |
| Tuesday, November 18 | Mocap Retargeting | |
| Thanksgiving | | |
| Tuesday, December 2 | Animation Feedback &<br>Customizations | |
| Tuesday, December 9 | Adjustments/fixes based on feedback.<br>Rendering & Compositing | A4: Mocap Retargeting &<br>Animation |