

## Course Description

New York University Moving Image Archiving and Preservation

CINE-GT 3403, Video Preservation I

Tuesday, 6:00pm - 9:00pm

665 Broadway, Room 643 Fall 2022

Class Dates: September 13, 20, 27; October 4, 11, 18; November 1, 8, 15, 22

## Instructor

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Office Hours by Appointment

# Video Preservation I

Video preservation calls for a diverse range of skills, with electrical systems, mechanical systems, signal processing electronics, chemical breakdown, digital file formats, archival standards, project management, and media history all competing for attention. In this class—the first in a two-semester course of study—students will be introduced to the basics, with a particular focus on optimizing the digitization process through the careful handling and preparation of videotapes and playback devices. Topics will include: the development of television and video technologies; the set-up and calibration of video playback and monitoring devices; open source tools and their impact on the archival community; maintaining (and building your own) video digitization stations; manipulating, testing, and packaging video files post-digitization; and troubleshooting, troubleshooting, troubleshooting.

## Learning Objectives

At the conclusion of this class, students will have gained:

- A thorough understanding of video signals—how they are created, recorded onto tape, and extracted through digitization
- The ability to identify, handle, and prepare for digitization a range of physical video formats
- The ability to set-up and calibrate video playback and monitoring equipment
- A working knowledge of commonly encountered video errors and anomalies
- Facility with video preservation software tools (proprietary and open source) and digital media files
- Experience troubleshooting hardware/software problems and the confidence to resolve unexpected issues (should/when they arise)

## Course Texts

All readings and viewing materials will be made available online, with links provided in the weekly topic overviews below.

## Attendance

Students will be expected to complete all assigned readings and participate in class discussions and lab activities. Attendance and punctuality are mandatory, and students should consult with instructors before October 1st if they expect to miss any classes.

## Technology Expectations

As a course that blends lectures with hands-on lab sessions, some focused on software tools, students will be expected to have a computer. If students are not comfortable performing installations on their personal computers, contact Dylan Lorenz ([dylan.lorenz@nyu.edu](mailto:dylan.lorenz@nyu.edu)) as soon as possible to discuss borrowing a MIAP laptop.

## Resource Directory

[https://drive.google.com/drive/folders/1u73qzfgV5vC5zQpMc\\_5Pp6eLT4OsOBz5?usp=sharing](https://drive.google.com/drive/folders/1u73qzfgV5vC5zQpMc_5Pp6eLT4OsOBz5?usp=sharing)

## Class Topics

CLASS 01 | SEPTEMBER 13, 2022

### TAPES

After getting-to-know-you opening remarks and an overview of the syllabus, we'll review the landscape of videotape and video preservation history. Topics will include: physical videotape formats; baking, cleaning, and other conservation methods; and tape handling techniques.

### Lab Activity

Students will break into teams of two and learn to take apart (and put back together) a range of commonly encountered videotape formats (U-matic, VHS, Hi8, DVCam). If time allows, a tape splicing demo.

- **Read**
  - Anne Smalta. [How to Splice Videotape](#).
  - Francis Dougherty, [NYPL Treatment for Sticky Tapes Requiring Incubation](#)
  - Mona Jimenez and Liss Platt. [Videotape Identification and Assessment Guide. Texas Commission on the Arts. 2004](#)
  - Peter Brothers. [VHS Examination Prior to Playback](#)
  - Peter Brothers. [Common Signs of Problem Tapes](#)
  - Peter Brothers. [Basic Inspection Techniques](#)
- **Watch**
  - Libby Hopfauf, [DVRescue: Videotape Repair Demo](#)
  - Siobhan Hagan, MemLabNet Tutorial, [Reshell a VHS](#)

CLASS 02 | SEPTEMBER 20, 2022

### SIGNALS

This class will cover one of the most important aspects of video preservation—video signal anatomy—and how complex video signals are recorded onto videotape and monitored during digitization. Special guest Morgan Morel of the [Bay Area Video Coalition](#) will join us remotely, with topics including: cathode ray tube (CRT) monitors, interlaced video, waveform/vectorscope basics, and reading video levels.

### Lab Activity

Calibrating a CRT monitor; calibrating a waveform monitor and vectorscope; using patch cables, test signal generators, and test tapes.

- **Read**
  - Weise, and Weynand, [How Video Works](#), Chapter 3, Scanning
  - The Cable Bible, [Section I.A](#), “Analog Video” (in particular: Composite, Component Y’PbPr, S-Video)
  - Tektronix: [NTSC Video Measurements](#), Section 4 (Setting Up a Genlocked Studio) and Section 7 (The Color Bars Signal—Why and How)
  - [Leader, A Primer in the Use of Waveform Monitors, Part 1](#)
  - [Leader, A Primer in the Use of Vectorscopes, Part 1](#)
  - [Leader, Video Test Signals, Part 2](#)

CLASS 03 | SEPTEMBER 27, 2022

### DECKS

Now that we’ve gotten a handle on the different types of video signals, we’ll begin our extended adventure into working with/building/troubleshooting video digitization stations, starting with the most critical piece of the puzzle: the videotape recorder (VTR), or “deck.” Topics will include: VTR mechanical and electronic systems; the videotape path; and the basic operation and maintenance of playback equipment.

### Lab Activity

Safely opening a videotape recorder; identifying parts of the videotape path; cleaning the tape path and videoheads.

- **Read**
  - Dave Ronan, [Practical VCR Repair, “Safety—For You and Your VCR”](#)
  - Dave Ronan, [Practical VCR Repair, “Understanding the Tape Path”](#)
  - Dave Ronan, [Practical VCR Repair, “Cleaning, Lubrication, and Inspection”](#)
- **Watch**
  - Dana Lee, [How 2” Quad Machines Worked](#)
  - Michael Angeletti, Stanford Media Preservation Lab, [VHS Tape Travels](#)
  - Siobhan Hagan, MemLabNet Tutorial, [Clean Your VHS Deck](#)

CLASS 04 | OCTOBER 4, 2022

### ADJUSTMENT (TBCs and Proc Amps)

Video in an inherently unstable medium and a range of issues—from tape deterioration and breakdown to VTR wear-and-tear—can inhibit proper playback. Time Base Correctors (TBCs) were the stabilizing devices designed to make video work, and they serve critical roles in contemporary video digitization. Topics will

include: time base errors (and their root causes); the differences between time base correction and frame synchronization; genlocking; processing amplification and video signal manipulation.

### **Lab Activity**

Four activities: (1) complex signal routing with a patch bay or video switcher; (2) genlocking, (3) building your own video digitization station; (4) making TBC and processing amplification adjustments.

- **Read**
  - Ben Turkus, [Time Base Correction: An Archival Approach](#)
  - Ethan Gates, Patch Bay Blog, "[About Time: Sifting Through Video Terminology](#)"
- **Watch**
  - Dana Lee, [Time Base Correctors and Frame Synchronizers](#)

CLASS 05 | OCTOBER 11th, 2022

### **CAPTURE**

No lecture this week, just three straight hours of digitizing as many tapes as we can. We'll have 3-4 stations set up in the Lab (Betacam, U-matic, VHS, and DV), and we'll use all of the skills we've developed thus far to make some preservation files.

- **Read**
  - [MIAP Lab Transfer Checklist for U-matic](#)

CLASS 06 | OCTOBER 18th 2022

### **AUDIO**

The overlooking of audio in the world of video is an epidemic, one that's had major ramifications on video preservation practice. This week, we'll strive to redress this imbalance, reviewing underlying technical concepts related to audio, learning to identify (and avoid) common audio problems, and developing strategies for troubleshooting audio-related issues. Topics will include: sound 101; audio tracks and audio heads; amplitude vs. frequency modulation; linear vs. hi-fi stereo; cables and connections; monitoring methods and competing measurement standards.

- **Read**
  - The Cable Bible, [Section II "Audio" and II.A: "Analog Audio"](#)
  - Ethan Gates, Patch Bay Blog, "[See What You Hear: Audio Calibration for Video Digitization](#)"
  - Florian Camerer, [On the Way to Loudness Nirvana: Audio Leveling with EBU R128](#)
- **Watch**
  - Morgan Morel, BAVC, [Working with the DPS-575 and Creating Audio Terminal Block Connectors](#)

### **Lab Activity**

Three activities: (1) demo of DPS-575 audio terminal block wiring, (2) setting audio levels for capture; (3) testing and adjusting audio levels in digital files.

\*\*\*\*\* No Class Week of October 25th \*\*\*\*\*

CLASS 07 | NOVEMBER 1, 2022

### CHARACTERISTICS AND CONFORMANCE (OF DIGITAL VIDEO FILES)

With special guest Ashely Blewer joining us remotely, we'll take a deep dive into the different kinds of file formats used in video preservation and learn how to use MediaConch to ensure that digital files conform to these standards.

#### Lab Activity

Break into groups of two to complete a Google Forms Quiz drawn from previous readings. After, we'll use MediaConch to test media files against user-generated policies.

- **Read**
  - Emanuel Lorain, [A short guide to choosing digital format for video archiving masters](#)
  - Ashley Blewer, [Pragmatic Audiovisual Preservation, Chapters 1-3](#)
- **Watch**
  - Monty Montgomery, [A Digital Media Primer for Geeks](#)
- **Download**
  - [Homebrew](#) (macOS only)
  - MediaConch GUI [<https://mediaarea.net/MediaConch/>]
  - MediaConch CLI [brew install mediaconch]
- **Review for Quiz**

Have all previous readings and lectures open for the quiz. Students will work together in pairs to complete 30 questions in 45 minutes, reviewing:

  - Transmission types and connectors
  - Interlace scanning
  - Videotape digitization best practices
  - Videotape conservation treatment
  - Video digitization rack components
  - Monitoring the video signal
  - International broadcast standards

CLASS 08 | November 8th 2022

### TRANSCODING AND MANIPULATION

In a shockingly brief period of time, the open source software FFmpeg has moved from the margins to center, becoming an indispensable tool of media preservation. The answer to the question “How do I do X or Y with my audio or video files?” can almost always be answered with FFmpeg. Transcoding, metadata inspection, checksumming, dealing with strange media—these are just a few of the things that are solidly in FFmpeg’s wheelhouse.

#### Lab Activity

Using FFmpeg to generate derivative files and create checksums for our final assignment deliverables; break into groups and complete three FFmpeg [exercises](#).

- **Read**

- [FFmpeg](#), particularly “FFmpeg Basics,” “Advanced FFmpeg Concepts,” and all recipes under the “Preservation Tasks” banner
- FFmpeg man pages (in terminal, type “man ffmpeg”)

CLASS 09 | NOVEMBER 15th, 2022

### CLASS VISIT TO NEW YORK PUBLIC LIBRARY

We’ll skip our regularly scheduled class this week and instead find a time mid-day/midweek to visit the Media Preservation Lab at New York Public Library. Baking, cleaning, tape prep; video, audio, film digitization...we’ll see it all!

CLASS 10 | NOVEMBER 22nd, 2022

### QUALITY CONTROL & PACKAGING

Why check your work? Because no matter how careful you are, something will inevitably go awry. *That* is the nature of video preservation, and hopefully by this point in the semester you’ve experienced some sort of weirdness that’s required troubleshooting/rework. In the lecture portion of this week’s class, we’ll review the different types of quality control (automated and manual) and give a thorough introduction to the open source quality control software QCTools.

#### Lab Activity

Using QCTools to perform quality control on our final assignment deliverables; reviewing common video errors and how they present themselves across video formats (BAVC video we’ll watch while eating cookies).

- Install:
  - [QCTools](#)
- Read/Review
  - [QCTools’ online documentation](#)
  - Ashley Blewer’s AV Preservation Training module on [QCTools](#)
  - [AV Artifact Atlas](#)
  - IASA TC-06, “[Guidelines for the Preservation of Video Recordings](#)”
    - D.1.1.4 Quality assurance, control, and critical control points
    - D.1.1.5 Quality control: how much science, how much art?
    - D.1.1.6 Broadcast community quality control initiatives for file-based video
    - D.1.4.3 Critical control factors: operating a digitising facility and system

## Assignments

Assignment #1, Due November 1st, 2022

### Open Book Team Quiz

Students will form teams of two and work together to complete an open book quiz (in Google Forms) drawn from lectures and readings from the first six class sessions. Topics may include: video and conservation basics; format identification; and signal routing, calibration, and monitoring.

## Assignment #2, Due November 22nd, 2022

### Tape Digitization & Quality Control

During a series of lab sessions, students will act as their own preservation units, tasked with (1) digitizing one videotape, (2) creating derivative files, and (3) performing quality control and packaging all related assets. The final deliverables should be transcoded using FFmpeg and packaged using BagIt. Each "bagged" package should be named with the same unique identifier as the tape, and include the following:

- 1 preservation master file (ffv1/mkv) and corresponding framemd5
  - UUID\_pm.mkv, UUID\_pm.framemd5
- 1 mezzanine file (prores hq 4:2:2/mov)
  - UUID\_prores.mov
- 1 access file (h264/mp4, up-res'd, pillarboxed, and deinterlaced)
  - UUID\_accessHD.mp4
- 1 QCTools report
  - UUID\_pm.mkv.qctools.xml.gz
- [1 Entry in a Shared Transfer Log](#) (with information about the preservation master file only)

### Digital Archive of Student Work

All student projects are to be collected and made accessible on the Student Work page of the MIAP website (<https://tisch.nyu.edu/cinema-studies/miap/student-work>). Certain types of assignments will be password-protected and made accessible only to MIAP students and faculty. Students are required to submit all of their work for each class to their professor in a digital format (.pdf is encouraged for cross-platform compatibility) via email or other available digital medium.

As a primary goal of NYU's MIAP Program is to be useful to the archival field, the default status of student works will be public (with the exception of internship reports and thesis proposals). Students, in consultation with their instructor, can make a case for why a particular assignment should be restricted to internal use. Proprietary information, confidential information, or copyright issues may lead to this decision, but not a general unwillingness to make work public.

### Formatting

When students submit digital files of their work, the file names should conform to MIAP's standard format, with f used to indicate fall semester and s used to indicate spring semester: YYsemester\_course number\_author's last name\_a[assignment#].file extension. Here is an example of a student with the surname Smith, submitting the first assignment in the fall 2022 course CINE-GT 1800: 22f\_1800\_Smith\_a1.pdf.

For multiple authors, the two initials of each author will be used, separated from each other by underscores. An underscore and the assignment number will follow this. Assignment numbers are determined by the order in which the assignments are given. They begin with an "a," followed by a number between one and ten. For assignments with multiple files, a letter can be added after the number. Thus, one could have "a1b," meaning that this is the second of multiple files from one student for one particular assignment. In the case of a restricted file that should not be made public, the student should add an "\_x" to the end of the file name indicating the file's restricted status: 22s\_1800\_Smith\_a1\_x.pdf. Otherwise, permission shall be implicitly granted for the student's work to be posted on the MIAP website.

## Grading

Grading will be Pass/Fail only (P/F on transcripts), with the final grade derived from the following:

- (1) Results of the two assignments (outlined above, 60%)
- (2) Class participation and a suitable level of preparedness, gauged by active participation and/or pop quizzes on readings (40%)

Your overall GPA will remain unaffected, but the units of a Pass grade will count toward graduation requirements.

## Important Policies and Resources

### **Tisch Policy on Academic Integrity**

The core of the educational experience at the Tisch School of the Arts is the creation of original work by students for the critical review of faculty members. Any attempt to evade that essential transaction through plagiarism or cheating is educationally self-defeating and a grave violation of Tisch's community standards. Plagiarism is presenting someone else's original work as if it were your own; cheating is an attempt to deceive a faculty member into believing that your mastery of a subject or discipline is greater than it really is. Penalties for violations of Tisch's Academic Integrity Policy may range from being required to redo an assignment to dismissal from the School. For more information on the policy—including academic integrity resources, investigation procedures, and penalties—please refer to the [Policies and Procedures Handbook](#) ([tisch.nyu.edu/student-affairs/important-resources/tisch-policies-and-handbooks](http://tisch.nyu.edu/student-affairs/important-resources/tisch-policies-and-handbooks)) on the website of the Tisch Office of Student Affairs.

### **Health & Wellness Resources**

Your health and safety are a priority at NYU. If you experience any health or mental health issues during this course, we encourage you to utilize the support services of the 24/7 NYU Wellness Exchange: contact 212-443-9999 or via their [website](#). Also, all students who may require academic accommodation due to a qualified disability, physical or mental, please register with the Moses Center for Student Accessibility (CSA): contact 212-998-4980 or via their [website](#). Please let your instructor know if you need help connecting to these resources. Students may also contact MIAP Director Juana Suárez ([juana@nyu.edu](mailto:juana@nyu.edu)) and/or Academic Program Manager, Jess Cayer ([jess.cayer@nyu.edu](mailto:jess.cayer@nyu.edu)) for help connecting to resources.

### **Sexual Misconduct, Relationship Violence, and Stalking Resource Guide for Students**

New York University (NYU) is committed to providing a safe environment for its Students. Sexual Misconduct, Relationship Violence, and Stalking are emotionally and physically traumatic, and are a violation of one's rights. There are many on-campus and community support services and resources available to help Students. Students are encouraged to consult the online [Sexual Misconduct, Relationship Violence, and Stalking Resource Guide for Students](#) ([nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/sexual-misconduct--relationship-violence--and-stalking-resource-.html](http://nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/sexual-misconduct--relationship-violence--and-stalking-resource-.html)) for detailed information about on-campus and community support services, resources, and reporting procedures. Questions about if this policy applies to your case should be directed to the Assistant Vice President of the Office of Equal Opportunity & Title IX Coordinator at



212-998-2370. Students are also welcome to report any concerns to MIAP Director Juana Suárez ([juana@nyu.edu](mailto:juana@nyu.edu)) and/or Academic Program Manager, Jess Cayer ([jess.cayer@nyu.edu](mailto:jess.cayer@nyu.edu)).

### **NYU Title IX Policy**

New York University (NYU) is committed to complying with Title IX and related laws and guidance, enforcing University policies prohibiting discrimination, and maintaining a safe learning, living, and working environment. To that end, the responsibilities of NYU's Office of Equal Opportunity (OEO) include managing the University's response to reports of discrimination, including alleged violations of [NYU's Sexual Misconduct, Relationship Violence, and Stalking Policy](#) (Sexual Misconduct Policy). Detailed information regarding these laws and related NYU policies and the resources that are available to students through the Title IX office can be found by using [this link](#). Questions about if this policy applies to your case should be directed to the Mary Signor, Assistant Vice President of the [Office of Equal Opportunity & Title IX Coordinator](#) at 212-998-2370 or [mary.signor@nyu.edu](mailto:mary.signor@nyu.edu). <https://www.nyu.edu/about/policies-guidelines-compliance/equal-opportunity/title9.html>

### **Non-Discrimination and Anti-Harassment Policy & Reporting Procedures**

New York University is committed to equal treatment and opportunity for its students; to maintaining an environment that is free of bias, prejudice, discrimination, harassment, and retaliation; and to establishing complaint procedures for allegations involving students. This policy demonstrates the University's strong commitment to prevent discrimination and harassment against students on the bases of several protected characteristics as set forth below. This policy applies regardless of whether the alleged wrongdoer is a student. This policy applies when the conduct occurs on NYU premises, in the context of an NYU program or activity (including but not limited to NYU-sponsored study abroad, research, or internship program), or the conduct occurs outside the context of an NYU program or activity but (i) has continuing adverse effects on NYU premises or in any NYU program or activity or (ii) occurs in close proximity to NYU premises and is connected to violative conduct on NYU premises. NYU strongly encourages all members of the University community who have been victims of prohibited discrimination, prohibited harassment, or retaliation to report the conduct. In the case of incidents of prohibited discrimination and prohibited harassment alleged to have been committed against students, the student complainant or other reporting party may make a report to anyone listed on this website:

#### [Non-Discrimination and Anti-Harassment Policy and Complaint Procedures](#)

([nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/non-discrimination-and-anti-harassment-policy-and-complaint-proc.html](https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/non-discrimination-and-anti-harassment-policy-and-complaint-proc.html)) which also has detailed information about on-campus and community support services, resources, and reporting procedures.

MIAP students may make such reports to MIAP Director Juana Suárez ([juana@nyu.edu](mailto:juana@nyu.edu)) and/or Academic Program Manager, Jess Cayer ([jess.cayer@nyu.edu](mailto:jess.cayer@nyu.edu)). Questions about if this policy applies to your case should be directed to the Mary Signor, Assistant Vice President of the [Office of Equal Opportunity & Title IX Coordinator](#) at 212-998-2370 or [mary.signor@nyu.edu](mailto:mary.signor@nyu.edu). <https://www.nyu.edu/about/policies-guidelines-compliance/equal-opportunity/title9.html>

### **NYU Guidelines for Compliance with the Family Educational Rights and Privacy Act (FERPA)**

The Family Educational Rights and Privacy Act of 1974 (FERPA) was enacted to protect the privacy of students' education records, to establish the rights of students to inspect and review their education records, and to provide students with an opportunity to have inaccurate or misleading information in their education records corrected. In general, personally identifiable information from a student's education

records, including grades, may not be shared without a student's written consent. However, such consent is not needed for disclosure of such information between school officials with legitimate educational interests, which includes any University employee acting within the scope of their University employment. See [here](http://nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/FERPA.html) (nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/FERPA.html) for full policy guidelines.

### **NYU Student Religious Observance Policy**

See [here](#) for the University Calendar Policy on Religious Holidays.

### **NYU Academic Support Services**

NYU offers a wide range of academic support services to help students with research, writing, study skills, learning disability accommodation, and more. Here is a brief summary:

### **NYU Libraries**

Main Site: [library.nyu.edu](http://library.nyu.edu); Ask A Librarian: [library.nyu.edu/ask](http://library.nyu.edu/ask)

70 Washington Square S, New York, NY 10012

Staff at NYU Libraries has prepared a guide (<http://guides.nyu.edu/c.php?g=276579&p=1844806>) covering services and resources of particular relevance to graduate students. These include research services and guides by topic area, subject specialists, library classes, individual consultations, data services, and more. There's also a range of study spaces, collaborative work spaces, and media rooms at Bobst, the library's main branch.

### **The Writing Center**

[nyu.mywconline.com](http://nyu.mywconline.com)

411 Lafayette, 4th Floor, 212-998-8860, [writingcenter@nyu.edu](mailto:writingcenter@nyu.edu)

The Writing Center is open to all NYU students. There, students can meet with a faculty writing consultant or a senior peer tutor at any stage of the writing process, about any piece of writing (except exams). Appointments can be scheduled in person and online. Most appointments will be in-person in the fall, although some online appointments will also be available.

### **The University Learning Center (ULC)**

[nyu.edu/ulc](http://nyu.edu/ulc); Academic Resource Center (18 Washington Pl, 212-998-8085) or University Hall (110 East 14th St, 212-998-9047)

The University Learning Center (ULC) aims to help students meet the challenge of the College's rigorous academic standards, to guide students in their adjustment to the college learning environment, and to prepare them for a lifetime of self-sufficient learning. On the website you can find sign-ups for free one on one peer tutoring, group review workshops, academic skills workshops, and more.

### **Moses Center for Student Accessibility (CSA)**

<https://www.nyu.edu/students/communities-and-groups/student-accessibility.html>

726 Broadway, 3rd Floor, 212-998-4980, [mosescsd@nyu.edu](mailto:mosescsd@nyu.edu)

New York University is committed to providing equal educational opportunity and participation for all students. The Moses Center for Student Accessibility (CSA) works with NYU students to determine and implement appropriate and reasonable accommodations as well as access available programs and resources to support equal access to a world-class education.

### **MIAP Resources for Current Students**

More resources for current MIAP students can be found here:

<https://tisch.nyu.edu/cinema-studies/miap/current-students> including the Program Contacts, links to the NYU MIAP Student Handbook, Academic Policies, Important Dates, and additional information for current MIAP students.