

Course Description

New York University Moving Image Archiving and Preservation
CINE-GT 3403, Video Preservation 1
Thursdays, 6:00pm - 9:00pm (or 6:00pm-8pm, see individual days)
Zoom/665 Broadway, Room 643 Fall 2020
Course Syllabus | v0.11

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 of videotapes and playback devices. Topics will include: the development of television and video technologies, open source tools and their impact on the archival community, working with (and building your own) video digitization station, manipulating and testing video files post-digitization, and troubleshooting, troubleshooting, troubleshooting. While we'll focus on the practical, some of the larger questions—what gets saved, and who gets to do the saving—won't be ignored.

COVID-19 Accommodations

The instructors have chosen a blended teaching model to minimize the risk of spreading the COVID-19 virus. To offer hands-on experience, we've designed a teaching schedule that alternates between online lectures and small group hands-on sessions held in the MIAP lab, supplemented with an optional take-home digitization kit. But for those who do not wish to travel to or enter NYU buildings, remote options for a final project will be made available. See the sections on Lab and Assignments for more detail.

Instructors

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Resource Directory:

<https://drive.google.com/drive/u/1/folders/0BxYHavxhGzAzbE440UpNdIBSU1U>

Learning Objectives

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

- A thorough understanding of video signals—how they're created, recorded onto tape, and extracted through digitization

- The ability to identify (and properly prepare for digitization) a range of video formats
- A working knowledge of commonly used video preservation software tools (proprietary and open source)
- Experience troubleshooting hardware/software problems and the confidence to resolve unexpected issues (should/when they arise)

Expectations

First and foremost, students are expected to complete all assigned readings, and participate in class discussions and demonstrations. Class participation and a suitable level of preparedness will account for 20% of the overall grade, with 80% of the grade based upon the results of the two assignments (outlined below). Attendance and punctuality are mandatory, and students should consult with instructors before October 1st if they expect to miss any classes.

Of the 12 scheduled classes, 7 will be held remotely via Zoom. During these remote sessions, students are expected to participate from a quiet place in their home, keep their computer video on and their microphone muted when not speaking. Questions and comments can be made using Zoom features such as “raise hand” or chat. Repeated absences or lateness to remote sessions will be penalized by a ½ grade point. **For those who expect to have limitations with video, audio, or internet access, please communicate with the instructors before class.**

As outlined below, the mid-term quiz will be completed in-class and students have three options to choose from for the final assignment. We highly encourage all students to make use of the optional at-home digitization kit, but due to the spectrum of health susceptibility and understandable anxiety due to COVID-19, this additional hands-on opportunity is not mandatory.

Your work may be made part of the MIAP Digital Archive in a private space for faculty use, and on the MIAP web site, where appropriate. Please inform the professors of any papers that cannot be published on the web due to confidentiality restrictions or other reasons, or if you have other concerns about your work being posted. In some cases, the title of a paper may be published, but access to the paper will be restricted to selected MIAP faculty and staff. When electronic files are submitted, the file names must conform to the standard format:

year semester_class number_author's last name_assignment number.extension

Example: 05s_1800_Smith_a1.doc

If you do not want your paper published, please put an “x” at the beginning of the file name.

Laptops and Digitization Kits

As a blended course combining online lectures with small hands-on lab sessions, students are expected to have a computer with Zoom installed at the beginning of the semester. Open source audiovisual preservation tools will be introduced as the course proceeds. If students are not comfortable performing installations on their personal machines, they should contact Greg Helmstetter (greg.helmstetter@nyu.edu) as soon as possible to discuss borrowing a MIAP loaner laptop.

Throughout the semester, a digitization kit will be made available. This kit includes all the hardware and software needed to build your own VHS digitization kit at home, including a VCR, time-base corrector, computer, and assorted cables and connectors. Students can coordinate with Greg Helmstetter to pick up equipment on a Thursday during the day and return on a Monday. Please use the Parallel Lab sessions schedule to indicate which days you will retrieve the kit

Parallel Lab Session Schedule

https://docs.google.com/spreadsheets/d/1oLuUc0Dull55jIjCjUjyEyiLGtW_FNrQ_2ZBvOi4AqA8/edit#gid=0

Assignments

Assignment #1, Due October 29th, 2020

Open Book Breakout Room Team Quiz

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

Assignment #2, Due December 10th, 2020

Students have three options to choose from for a final project. Students who opted for all remote learning are also welcome to propose a final project; if interested, please email both instructors with your ideas before October 1st.

Option #1 - Preservation Lab Tape Digitization & Quality Control

During a single, 3-hour supervised lab session, students will act as their own preservation units, tasked with (1) digitizing a U-Matic videotape, (2) creating derivatives and performing quality control on all resulting files, and (3) 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 Transfer Log (with only information about the preservation master file)
- Perform quality control on one other student's work (remotely)

Option #2 - DIY Rack w/Wiring Diagram

Students will coordinate with Greg Helmstetter on retrieving the portable VHS digitization kit. The kit includes everything needed for building a professional digitization station at home, including a laptop, external hard drive, time-based corrector, audio mixer, etc. The deliverable for this project will be a wiring diagram that maps out the signal flow and photos of the final set up. Students can schedule a parallel lab session to have remote assistance with setting up their rack.

Option #3 - Technical Paper

Students will write a short research paper on one of the following topics, and prepare a brief (5 minute) presentation for the class about what they've learned. Write-ups should focus on (1) the technical makeup of the video-related topic; (2) a brief review of its history; and (3) its potential significance in digitizing videotapes. The paper should be between 800 - 1200 words at a minimum. Sources must be cited. Students will choose from the following:

- Timecode
- Control track
- RS-422
- Blanking intervals (horizontal and vertical)
- Scanning methods (transverse vs. helical)
- Firewire (IEEE 1394)

Lab

Beginning in Week 3, the course will transition from weekly to biweekly remote lectures, with lab sessions filling in the off weeks. These lab sessions—your opportunity to get hands-on video digitization experience and complete the final assignment—will be held on-site in the MIAP Lab (655 Broadway), in small groups designed to ensure proper social distancing. While students will be assigned to their lab sessions at the start of the semester, we will of course offer accommodations to any student who puts in a request. Again, the at-home digitization kit will be made available on a rotating basis to supplement these limited on-site opportunities.

Classes

WEEK 01 | SEPTEMBER 10, 2020 | REMOTE LECTURE | 6PM - 9PM

The Error-Filled Road Ahead: How Video Works // How VCRs Work (and often don't work)

After getting-to-know-you opening remarks and a review of the syllabus, we'll review the landscape of video and video preservation, touching upon video signal basics, the seemingly endless variety of physical video formats, learning to critically view and identify errors by format, and VCR electronic and mechanical systems.

- Read
 - How Video Works, "Video Scanning" pg. 15-24 (9 pages)
 - How Video Works, "Synchronizing Signals" pg. 25-37 (12 pages)
 - How Video Works, "Color Video" pg. 53-68 (15 pages)
 - How Video Works, "The Encoded Signal" pg. 113-122 (9 pages)
 - How Video Works, "Television Standards" pg 135-152 (16 pages)

- Watch
 - How 2" Quad Machines Worked, <https://www.youtube.com/watch?v=fpBRuheelu4>

WEEK 02 | SEPTEMBER 17, 2020 | REMOTE LECTURE & EXERCISE | 6PM - 8PM

Sticky Shed Fingers: Magnetic Media Conservation You Can't Keep Away

Without further referencing the Rolling Stones' best album, this class will cover one of the most important aspects of video preservation—triage, the preparing tapes for digitization through cleaning (by machine and by hand), baking, and other weird treatments.

Group exercise/Demonstration: Kelly will demonstrate how to open/close a U-matic tape for baking. TBD is whether we can mail tapes to individual students so that they can follow along.

- Read
 - Crystal Sanchez, "Heating Things Up: A History of Baking Tapes for Video Preservation" https://www.nyu.edu/tisch/preservation/program/student_work/2010fall/10f_2920_sanchez_a2a.pdf
 - Presto Space, "D6.1 : Report on video and audio tape deterioration mechanisms and considerations about implementation of a collection condition assessment method." (Pages 8-13) <https://drive.google.com/drive/u/1/folders/0BxYHavxhGzAzX3E2cW5Bb0I2N2M>
 - Peter Brothers, "Common Signs of Problem Tapes (U-Matic and Betacam)" http://www.specsbros.com/uploads/7/1/9/0/71903471/diqi_9_common_cassette_problems_rev_2.pdf
 - Peter Brothers, "Basic Inspection Techniques to Sample the Condition of Magnetic Tape" http://www.specsbros.com/uploads/7/1/9/0/71903471/white_pages-basic_inspection_techniques9.pdf

WEEK 03 | SEPTEMBER 24, 2020 | PARALLEL LAB SESSIONS | 6PM - 9PM

Students can sign up for lab sessions here. Only two students are allowed per session.

https://docs.google.com/spreadsheets/d/1oluUc0Dull55jIjCujyEyiLGtW_FNrq_2ZBvOi4AqA8/edit#gid=0

WEEK 04 | OCTOBER 1, 2020 | REMOTE LECTURE | 6PM - 8PM

The Rack: Components, Signal Flow, Monitoring, Calibration, and Testing

Now that we've gotten a handle on the different types of video signals (and how they're recorded onto tape), we'll begin our extended adventure into working with/building/troubleshooting video digitization stations.

- Read
 - How Video Works, "Monitoring the Color Image,"
 - How Video Works, "Analog Waveform Monitors," "
 - How Video Works, "Analog Vectorscopes."
 - IASA TC-06, "Guidelines for the Preservation of Video Recordings" D.1.3 Setting up and testing a digitising facility and system, D.1.4 Operating a digitising facility and system https://www.iasa-web.org/sites/default/files/publications/IASA-TC_06-D_20180611.pdf

- MIAP Lab Transfer Checklist for Umatic:
<https://docs.google.com/document/d/1Ev5WxjbUPIRAHFw7Hdd00lhYaadmMTSt-0YWovAzCM8/edit>

WEEK 05 | OCTOBER 8, 2020 | PARALLEL LAB SESSIONS | 6PM - 9PM

Students can sign up for lab sessions here. Only two students are allowed per session.

https://docs.google.com/spreadsheets/d/1oluUc0Dull55jJcUjyEylGtW_FNrq_2ZBvOi4AqA8/edit#gid=0

WEEK 06 | OCTOBER 15, 2020 | REMOTE LECTURE | 6PM - 8PM

DVRescue to the Rescue

Popular throughout the 1990s and 2000s, DV videotape—a family of formats which includes DVCam, MiniDV, HDV, and DVCPRO—requires a completely different preservation approach, one more akin to migration than straight “digitization.” Due to various obsolescence factors and the unique nature of DV as a born-digital lossy encoding that’s directly recorded onto tape, DV represents both potential and peril for archivists. During this week’s lecture, we’ll be visited by **special guest Libby Hopfauf** of Moving Image Preservation of Puget Sound ([MiPoPS](#)), an awesome non-profit that’s been spearheading the NEH-funded [DVRescue](#) Project.

- **Read**
 - Adam Wilt, “The DV, DVCAM, and DVCPRO Formats”
<https://www.adamwilt.com/DV-tech.html>
 - UCLA Library IDEP Partner Toolkit “MiniDV Transfer” [note: this website predates the DVRescue project but provides a solid overview]
<https://uclalibrary.github.io/ideptoolkit///minidv>
 - DVRescue Documentation
Link TBD

WEEK 07 | OCTOBER 22, 2020 | PARALLEL LAB SESSIONS | 6PM - 9PM

Students can sign up for lab sessions here. Only two students are allowed per session.

https://docs.google.com/spreadsheets/d/1oluUc0Dull55jJcUjyEylGtW_FNrq_2ZBvOi4AqA8/edit#gid=0

WEEK 08 | OCTOBER 29, 2020 | QUIZ & LECTURE

Codecs, Conformance, Standards: Preservation digital file formats and their discontents

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. But first! Classmates will pair off into breakout sessions to complete a quiz on the previous readings.

- **Read**
 - Savannah Campbell, “The Great Video Codec Debate”
https://www.nyu.edu/tisch/preservation/program/student_work/2016fall/16f_1807_Campbell_a2.pdf
 - Dave Rice, “Audiovisual Adherence.” Tate Research Publications
<http://www.tate.org.uk/research/publications/audiovisual-adherence>

- Kate Murray, The Signal Blog , “New FADGI MXF AS-07 Specification and Sample Files Published”
<https://blogs.loc.gov/thesignal/2017/10/new-fadgi-mxf-as-07-specification-published/>
- **Skim**
 - FADGI Digital File Formats for Videotape Reformatting Part 5. Narrative and Summary Tables
http://www.digitizationguidelines.gov/guidelines/FADGI_VideoReFormatCompare_pt5_20141202.pdf
- **Download**
 - [Homebrew](#) (macOS only)
 - MediaConch GUI [<https://mediaarea.net/MediaConch/>]
 - MediaConch CLI [brew install mediaconch]

WEEK 09 | NOVEMBER 5, 2020 | PARALLEL LAB SESSIONS | 6PM - 9PM

Students can sign up for lab sessions here. Only two students are allowed per session.

https://docs.google.com/spreadsheets/d/1oLuUc0Dull55jJcUjyEjLGtW_FNrq_2ZBvOi4AqA8/edit#gid=0

WEEK 10 | NOVEMBER 26, 2020 | REMOTE LECTURE | 6PM - 8PM

Digitization is Half the Battle: Introducing FFmpeg

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 with my audio or video files?” is almost always 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.

- **Bring**
 - Laptop. If you can’t bring your own, the MIAP technician can provide you with a MIAP loaner (just make sure to give her a few days notice).
- **Download**
 - FFmpeg (brew install ffmpeg)
- **Read**
 - FFmpegprovisr, particularly “FFmpeg Basics,” “Advanced FFmpeg Concepts,” and all recipes under the “Preservation Tasks” banner
<https://amiaopensource.github.io/ffmpegprovisr/>
 - FFmpeg man pages (in terminal, type “man ffmpeg”)

WEEK 11 | DECEMBER 3, 2020 | PARALLEL LAB SESSIONS | 6PM - 9PM

Students can sign up for lab sessions here. Only two students are allowed per session.

https://docs.google.com/spreadsheets/d/1oLuUc0Dull55jJcUjyEjLGtW_FNrq_2ZBvOi4AqA8/edit#gid=0

WEEK 12 | DECEMBER 10, 2020 | REMOTE LECTURE | 6PM - 8PM

Any Quality Control is Better Than No Quality Control

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, Ben and Kelly will break down the different types of quality control (automated and manual) and give a thorough review of QCTools.

- Install:
 - [QCTools](#)
 - Read
 - [QCTools' online documentation](#)
 - Ashley Blewer's AV Preservation Training module on [QCTools](#)
 - 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
- https://www.iasa-web.org/sites/default/files/publications/IASA-TC_06-D_20180611.pdf

-----FINAL ASSIGNMENT DELIVERED BY DECEMBER 10TH-----

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) 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 212-443-9999. Also, all students who may require an academic accommodation due to a qualified disability, physical or mental, please register with the Moses Center 212-998-4980. Please let your instructor know if you need help connecting to these resources. Students may also contact MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu) for help connecting to resources.

Sexual Misconduct, Relationship Violence, and Stalking Policy & Reporting Procedures

NYU seeks to maintain a safe learning, living, and working environment. To that end, sexual misconduct, including sexual or gender-based harassment, sexual assault, and sexual exploitation, are prohibited. Relationship violence, stalking, and retaliation against an individual for making a good faith report of sexual misconduct are also prohibited. These prohibited forms of conduct are emotionally and physically

traumatic and a violation of one's rights. They are unlawful, undermine the character and purpose of NYU, and will not be tolerated. A student or employee determined by NYU to have committed an act of prohibited conduct is subject to disciplinary action, up to and including separation from NYU. 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) for detailed information about on-campus and community support services, resources, and reporting procedures. Students are also welcome to report any concerns to MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu).

Non-Discrimination and Anti-Harassment Policy & Reporting Procedures

NYU is committed to equal treatment and opportunity for its students and to maintaining an environment that is free of bias, prejudice, discrimination, and harassment. Prohibited discrimination includes adverse treatment of any student based on race, gender and/or gender identity or expression, color, religion, age, national origin, ethnicity, disability, veteran or military status, sexual orientation, marital status, or citizenship status, rather than on the basis of his/her individual merit. Prohibited harassment is unwelcome verbal or physical conduct based on race, gender and/or gender identity or expression, color, religion, age, national origin, ethnicity, disability, veteran or military status, sexual orientation, marital status, or citizenship status. Prohibited discrimination and harassment undermine the character and purpose of NYU and may violate the law. They will not be tolerated. NYU strongly encourages members of the University Community who have been victims of prohibited discrimination or prohibited harassment to report the conduct. MIAP students may make such reports to MIAP Director Juana Suárez (juana@nyu.edu) and/or Associate Director Scott Statland (scott.statland@nyu.edu), or directly to Marc Wais, Senior Vice President for Student Affairs. Students should refer to the University's

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) for detailed information about on-campus and community support services, resources, and reporting procedures.

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](#) (nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/FERPA.html) for full policy guidelines.

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; Ask A Librarian: 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

411 Lafayette, 4th Floor, 212-998-8860, 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 online. Students for whom English is a second language can get additional help with their writing through a monthly workshop series scheduled by the Writing Center (cas.nyu.edu/content/nyu-as/cas/ewp/writing-resources/rise-workshops.html).

The University Learning Center (ULC)

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

Peer Writing Support: All students may request peer support on their writing during drop-in tutoring hours for "Writing the Essay / General Writing" at the University Learning Center (ULC), which has two locations noted above. Students for whom English is a second language may wish to utilize drop-in tutoring geared towards international student writers (see schedule for "International Writing Workshop").

Academic Skills Workshops: The ULC's Lunchtime Learning Series: Academic Skills Workshops focus on building general skills to help students succeed at NYU. Skills covered can help with work in a variety of courses. Workshops are kept small and discuss topics include proofreading, close reading to develop a thesis, study strategies, and more. All Lunchtime Learning Series workshops are run by Peer Academic Coaches.

Moses Center for Students with Disabilities

nyu.edu/students/communities-and-groups/students-with-disabilities.html

726 Broadway, 3rd Floor, 212-998-4980, mosescsd@nyu.edu

All students who may require an academic accommodation due to a qualified disability, physical or mental, are encouraged to register with the Moses Center. The Moses Center's mission is to facilitate equal access to programs and services for students with disabilities and to foster independent decision making skills necessary for personal and academic success. The Moses Center determines qualified disability status and assists students in obtaining appropriate accommodations and services. To obtain a reasonable accommodation, students must register with the Moses Center (visit the Moses Center website for instructions).