MOVING IMAGE ARCHIVING AND PRESERVATION

MOVING IMAGE AND SOUND: BASIC ISSUES AND TRAINING
GT-2920

Fall 2020
Thursday 10-5pm, room 643, 665 Broadway
(We will meet as a group from 10-12 in room 674, 721 Broadway, or on Zoom for students opting for remote instruction.
From 12:30-5:00, we will meet in small groups in the lab (643) on the sixth floor of 665 Broadway.
Details will be discussed in the first class meeting.)

Instructor: Ann Harris
ann.harris@nyu.edu
212-998-1606
665 Broadway, room 636
Office hours by appointment, on Zoom

Class requirements:

Attendance is required at all regularly scheduled class sessions. Any unexcused absence may result in an incomplete. All activities (practice sessions and field trips) not scheduled during the Thursday class time (i.e., 10-5) are strongly recommended, but failure to attend will not result in an incomplete.

Class participation is absolutely required in this class. The major part (70 percent) of your grade is based on class participation. This includes hands on projects, practice, and tests, as well as verbal class participation.

There is one written project in the class. This project includes an in-class, Zoom presentation. The project represents 30 percent of your grade. Your ability to deliver the paper and presentation on time will be a significant part of that grade.

Required Readings:

- Moving Image Technology: From Zoetrope to Digital, Leo Enticknap, 2005, Wallflower Press
- How Video Works: From Analog to High Definition (3rd edition), Marcus Weise and Diana Weynand, 2016, Focal Press
- Color Mania: The Material of Color in Photography and Film, Barbara Flueckiger, Eva Hielscher, Nadine Wietlisbach (ed), Fotomuseum Winterthur, 2019
- The Art of Film Projection, Paolo Cherchi Usai, Spencer Christiano, Catherine Surowiec, Timothy Wagner, George Eastman Museum, 2019
- Other readings are taken from a variety of sources, many of them available online, through links provided on the web version of this syllabus. Some readings and resources, that are not otherwise available online, will be available through NYU Classes.
- To access NYU Classes, log in to NYUHome (https://globalhome.nyu.edu), click the Academics tab, and then click the course link in the list provided. If this class does not appear in the list, try clicking the "Update Classes Information" link at the bottom of the academics channel. If you still have trouble accessing an NYU Classes site, contact the IT Service Desk at 1-212-998-3333.
- Some of the texts not available online will be on reserve at the Cinema Studies/MIAP Film Study Center, located on the sixth floor of 721 Broadway. https://www.nyu.edu/projects/cinema.resources/cinemaresources.html
Class Goals:
After completing this course, you should:

- Have demonstrated basic film repair skills
- Be familiar with a range of documentation/media systems and tools
- Have mastered basic moving image inspectio and condition assessment skills
- Have mastered basic moving image handling techniques and skills
- Understand the physical properties of moving image media
- Be familiar with physical storage standards for various kinds of media
- Be able to identify a variety of moving image formats
- Understand the history of moving image formats and their conditions for their development
Visit websites:
- History of sub-35 mm Film Formats & Cameras on Welcome to Ani-mato!, Jan-Eric Nyström, 2003-5.
- Descriptions of the 4 film gauges on the homepage of http://www.littlefilm.org/
- More than one hundred years of Film Sizes by Michael Rogge, 1996.
- The Ultimate Table of Formats-- Aspect Ratios by Mark Baldock.
- Leo Enticknap, "Film" and "Cinematography and Film Formats", Moving Image Technology, pp 4-73.
- Image Permanence Institute: filmcare.org (take a look at the Motion Picture Film Technology Timeline)

Optional:
- National Film and Sound Archive: Technical Preservation Handbook (first 5 sections: Film Construction, Base Polymers and Decomposition, Gelatin, Image Forming Materials, Damage to Film)
- Ken Marsh, "The Big Works", Independent Video, pages 1-6. (Find this on NYU Classes or read reserve copy in Cinema Studies/MIAP Film Study Center)

Topics covered:
- Introduction to the physical and chemical structure of film
- History and variety of film formats
- What artifacts exist as a result of media production? What should be saved? How can Knowledge of production process aid identification?

Practice:
- Film Handling Techniques and Tools
- Use of rewinds and split reels

Important:
View this film before next class session: Discovering Cinema: Movies Learn to Talk, 2004, Eric Lange and Serge Bromberg
https://video-alexanderstreet-com.proxy.library.nyu.edu/watch/discovering-cinema-learning-to-talk

Choose written project topics in class.

Sept 17 -- Video and Audio Formats / Audio For Film

Assignments due before class:
Discovering Cinema: Movies Learn to Talk, 2004, Eric Lange and Serge Bromberg
https://video-alexanderstreet-com.proxy.library.nyu.edu/watch/discovering-cinema-learning-to-talk

Read:
- Leo Enticknap, Moving Image Technology, pp. 98-131 and 159-186
- Video Preservation Handbook, pp 1-6 section II. (on AMIA page, scroll down to find the link)

Visit websites:
- Timothy Vitale and Paul Messier, 2013, video preservation.
- California Preservation Audiovisual format identification guide
- Texas Commission on the Arts Videotape Identification and Assessment Guide

Review:
- Pictorial History of Media Technology
- LabGuy’s World: The History of Video Tape Recorders before Betamax and VHS
- Museum of Obsolete Media
- Terra Media’s Chronology of Video
Optional—Watch and Listen:
- Sound Recording and Reproduction (Sound on Film) [http://www.archive.org/details/SoundRec1943](http://www.archive.org/details/SoundRec1943)

Optional—Read:
- VideoFreex, "Hardware," Spaghetti City Video Manual, pp. 3-27

Topics covered:
- Introduction to the physical and chemical structure of audio and video media
- The technologies behind audio and video signals and formats
- History of audio and video formats
- Relationship between media and signal

*The Secret Life of the Video Recorder*, original air date: February 12, 1991, Channel 4, Tim Hunkin

Practice:
- Re-housing media
- Practice loading and transporting media

Important:

View this film before next class session: *Discovering Cinema: Movies Dream in Color*, 2004, Eric Lange and Serge Bromberg

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Sept 24 -- Film Identification/Inspection and Documentation / Color Systems

Assignments due before class:

*Discovering Cinema: Movies Dream in Color*, 2004, Eric Lange and Serge Bromberg

Read:
- *Guide to Identifying Color Movie Film Stocks* by Paul Ivestor.
- Paul Read and Mark-Paul Meyer, "Identification of Archive Film and Interpretation of Historical Data," Restoration of Motion Picture Film, pp. 53-68.
- Barbara Flueckiger, *Timeline of Historical Film Colors*.
  - Film Handling and Inspection,
  - Film Condition Report, National Screen and Sound Archive, Australia,
- National Film and Sound Archive (Australia), *Film Identification*, Film Preservation Handbook
- Kodak, *Handling Processed Film*
- *Shrinkage Measured*, AMIA, 2003. (on AMIA page, scroll down to find the link, under Guidelines)

Optional—Read:
- Thilo Koenig, “(In) Visible Color”, *Color Mania*, pp. 51-78.

Topics covered:
- Film Color
- Film Identification
  - Film Formats
  - Recognizing Film Element Type (release print, A/B rolls, negatives, etc.)
  - Recognizing basic film types (reversal vs. print from negative; kinds of sound tracks, etc.)
  - Film Edge Codes
- Film Inspection
  - Recognizing mechanical damage to film
  - Recognizing chemical/biological damage to film
- What is vinegar syndrome?
  - Using and reading AD strips

Practice:
- edge code reading exercise
- reading and setting up AD strip tests

Oct 1 -- Media Storage / Film Repair Techniques and Tools

Assignments due before class:

Read:
- Screensound Australia, *Technical Preservation Handbook*
  - Condition Reporting
  - Photo Duplication: Image Quality
  - Cold Storage of Film
  - Long Term Storage
  - Work Health and Safety
- IPI Climate Notebook, Image Permanence Institute.
- James M. Reilly, *IPI Storage Guide for Acetate Film*, Image Permanence Institute
- James M. Reilly *IPI Storage Guide for Color Film*, Image Permanence Institute
- Kodak, *Splicing For the Professional*, Film Notes Issue #H-50-01. On the Film-Tech page, in the upper left corner, click on "warehouse home", then manuals. Scroll down to "Eastman Kodak Film Notes". It is the first listed
- National Film and Sound Archive (Australia), *Film Repair*, Film Preservation Handbook.

Topics covered:

- Film Inspection
- Film shrinkage
  - Use of Shrinkage gauge
- Film Quality Assessment
  - Color quality, contrast, grain, resolution, sharpness
- Film Storage Issues
- Using 16mm film viewers
  - Table Top Viewers
  - Cinescan
  - Steenbeck
- Film Repair Techniques and Tools
  - hot splicers
  - tape splicers
  - Sprocket repair

Important:
Sign up for first film splicing practice time appointments.
Oct 8 -- Film Handling and Presentation: Projection and Optics

Assignments due before class:

Read:

Topics covered:
- Inside a 16mm Projector
- Small gauge film projection practice

Important: Format History Outline due next week (10/15) before class begins, (approximately 2 pages)

Oct 15 -- Analog Signal Errors / Audio History and Preservation

Assignments due before class:

Read:
- Sound Directions Publication, Read Chapter 4. “Metadata”.
- Bobst Library Preservation-ViPIRS project: ¼” Audio Tape

Review:
- AES Audio Metadata Standards

Topics Covered:
- Audio Tape history and tape structure
- Analog Signal Error
- Audio Preservation Workflow
- Database versus Spreadsheet

Practice:
- Practice loading and transporting various audio media
- Practice collecting metadata for analog audio material

Important:
- Sign up for audio digitization sessions with Greg Helmstetter.
- Format History Outline due before class (approximately 2 pages)

Oct 22 -- Digital Images / Machine Calibration / Video Format Identification, The Video Signal, Inspection and Assessment

Assignments due before class

Read:
- **Task Force to establish selection criteria of analogue and digital audio contents for transfer to data formats for preservation purposes**, Click Publications -> IASA Publications and scroll down.
- AMIA Videotape Preservation Fact Sheets, Tape Inspection (Fact Sheet 9, begins page 20), Video Preservation Fact Sheets, 2003. (on AMIA page, scroll down and find the link)
- John W.C. Van Bogart, Magnetic Tape Storage and Handling.
- Fred R. Byers, Care and Handling of CDs and DVDs.
- Video Preservation Handbook, pp 7, section II.
Visit website:
- Experimental TV Center

Screenings:
- How TV Works, Dan Sandin, 1977, 27 min. 28 sec.

Topics covered:
- The state of assessment and prioritization
- Available tools and guides
- Degradation mechanisms and risks of loss
- Care and handling of AV media for preservation
- Equipment and tools needed for identification and inspection

Practice:
- Practice using identification and inspection tools
- Practice: calibrating equipment

Oct 29 -- Video Preservation Issues

Assignments due before class

Read:
- Luke Hones, Experimental Video Center, Reel to Real: A Case Study of BAVC's Remastering Model
- Johannes Gfeller, Agather Jarzcyk, Joanna Phillips, Compendium of Image Errors in Analogue Video, pp. 48-115 and 160-170 (there is a copy of this book on reserve in the Film Study Center)
- NYU Preservation and Conservation Lab, Digitizing Video for Long-Term Preservation: An RFP Guide and Template
- David Rice and Chris Lacinak, Digital Tape Preservation Strategy: Preserving Data or Video?
- Chris Lacinak, A Primer on Codecs for Moving Image and Sound Archives
- Chris Lacinak, panel chair, AMIA/IASA 2010 • Wrappers and Codecs: A Survey of Selection Strategies
- A/V Artifact Atlas, BAVC
- American Society of Media Photographers, Video File Format Overview: http://www.dpbestflow.org/Video_Format_Overview

Topics covered:
- Analog Video History: What Are We Preserving
- Analog Video Signal Errors
- Characteristics of Digital Video Formats
- Preservation Formats: what are the issues?

Screenings:
- Calligrams, Steina and Woody Vasulka, 1970 (excerpt: 4 min.)
- Video Tape Repair, 1986 (excerpt: 5 min.)
- Playback: Preserving Analog Video (excerpts)

Practice:
- Video Cleaning techniques
Nov 5 -- Film Preservation Issues

Assignments due before class

Read:
- Read, Paul and Mark-Paul Meyer. "Introduction to the Restoration of Motion Picture Film", Restoration of Motion Picture Film, Oxford: Butterworth-Heinemann, 2000, pp 1-5.
- Gartenberg, Jon, "The Fragile Emulsion", The Moving Image 2:2 (Fall 2002), pp 142-152
- Annette Melville, The Film Preservation Guide.
  - The Curatorial Role
  - Duplication
- Audio-Visual Working Group, 2016, Digitizing Motion Picture Film: Exploration of the Issues

Optional Reading
- Screen Sound Australia, Photo Duplication, Film Preservation Handbook.

Topics covered:

Film Preservation Issues:
- Film preservation terminology: How do we differentiate among the terms preservation, conservation, restoration, reconstruction?
- What are some of the major issues with film preservation?
- What is the role of the film laboratory?
- Film Preservation--using digital means

Important:

Class does not meet next week.
Format History paper and class presentations due next class meeting (November 19).
Turn in digital copies of presentation before class begins.

Nov 12 -- No Class -- AMIA Conference

Nov 19 -- Student Presentations of Format / Process History Project
Format History Project: digital copies of presentation must be delivered by the start of class;
Class will be remote only, starting at 12pm.
Final papers for Format Project are due before class begins on December 3.

Dec 3 -- Film Scanning / Film Access Copies / Reports from AMIA
Final papers for Format Project are due before class begins

Assignments due before class:

Read:
- Department MWA Flashscan handbook on NYU classes
- Preserving Early Motion Picture History with the Kinetta Archival Scanner

Review:
METS primer.
PBCore Metadata Dictionary and Guide.
PREMIS

Topics covered:
• Focus on Technical and Structural metadata
• The role of metadata generated in inspection, assessment and preparation for long term storage and reformatting
• Known preservation issues/concerns
• What, if any, technological capabilities led to the demise of the format / process in the market?
• What, if any, technological capabilities were introduced on entry of the format / process into the market?
• Well known processes often associated with the format / process
• Main user groups and use environments
• Compelling forms, processes, processes or equipment associated with individual formats/ processes

Class Meets at 10:00am to 1:00pm - The 35mm Projection Booth, 721 Broadway, room 648

Research Project—Historical Paper and Presentation:
In this project, each student will choose one film, video or audio format or one film, video or audio process to research. You must properly cite reference sources. Here is a link to the Chicago / Turabian style notation and formatting: https://writing.wisc.edu/Handbook/DocChicago.html. You must create an annotated bibliography and a detailed description/history that must include:

• Time period for the format / process
• Associated equipment/devices or environment:
  • oxide used, track configuration, physical dimensions, housing, sprocket size and configuration, etc.
  • Physical/electronic measurement and properties: the structure, platform requirements, compression, codecs, etc.

All projects must be submitted in electronic format. The final versions of these projects will be made part of the MIAP digital archive, available online.

Examples of student work from 2006-2018

Research Assignment

7pm Session – Wrap up
6pm Session – 35mm Projection

Topics covered:
• AMLA Venue Assessment for 35mm Projection
• Cinema Studies Department 35mm Projection Manual
• Toroidal Easel—which, “Designing and Equipping a Cinema for the Presentation of Modern and Historic Films”,

Assignments due before class:

2:00pm – The MIAP Lab
Class Meets at 10:00am to 1:00pm - The 35mm Projection Booth, 721 Broadway, room 648

Dec 10 – 35mm Projection / Low Budget Film Access copies / Wrap up

Digital Cinema

The role of metadata generated in inspection, assessment and preparation for long term storage and reformatting

Topics covered:
• PREMIS
• PBCore Metadata Dictionary and Guide
• METS primer
The annotated bibliography should cover the whole format / process, but the paper, beyond the elements above, can focus on one aspect or variation of the format or process.

FORMATS / PROCESSES (you must choose a topic from this list or propose an alternative, with a written justification that must be accepted by your instructor. Alternative topics must fit the basic structure of the project as described above):

- 16 2/3 rpm vinyl record (audio)
- Bernoulli Box (data storage)
- CD Video (CDV) (video)
- compressed air pneumatic auxiliary amplification
- Cousino Echomatic cartridge
- dichroic prisms
- Exabyte tape (data tape)
- Herophon
- film recorder (film)
- UMD Video (universal media disk)
- Foma Film (film)
- Grundig Stenorette tape cartridge
- hipac (audio)
- Recordgraph
- pinchart (film color process)
- Technicolor Sound Movie Cartridge
- wire cartridge (RCA)
- Sirius Kleuren Film Maatschappij (film color process)
- Sony "EV (video)
- Stenocord magnetic belt
- Telediagraph / telephoto / radiophoto
- tefifon (audio)
- Vacuumate Film Protective Process

A brief list of resources:

- The Pal Site (http://www.palsite.com/)
- The American Widescreen Museum, (http://www.widescreenmuseum.com/index.htm) information on color processes, sound, as well as widescreen processes.
- Museum of Obsolete Media
- Manufacturer Websites
- Equipment Manuals
- Patents
- Journal of the SMPE/SMPTE (digitized versions of some issues, post 1930: http://www.archive.org/search.php?query=motion%20picture%20engineers%20AND%20mediatype%3Atexts). Hard copies of many issues available through the department Film Study Center
- Brown, FIAF Technical Manual
- Coe, History of Movie Photography
- Ryan, A History of Motion Picture Color Technology

Due dates---Two page outline, October 15. The outline should be as specific as possible. It should show how you will address the topics listed above and should contain the beginnings of your bibliography. It does not, however, have to be in the form of an outline. It must include one or two paragraphs that clearly describe what you propose to do.

Final written report, December 5, at the beginning of class; In class presentation, November 21 (digital copies of presentation due at beginning of class).
Annotated Bibliography

An annotated bibliography is an organized list of sources, each of which is followed by a brief note or “annotation.”

These annotations do one or more of the following:

- describe the content and focus of the book or article
- suggest the source’s usefulness to your research
- evaluate its method, conclusions, or reliability
- record your reactions to the source.

Your annotated bibliography may include some of these or all of these.

Plagiarism Advisory:
Plagiarism and other violations of the University's published policies are serious offenses and will be punished severely. Plagiarism includes presenting or paraphrasing a phrase, sentence, or passage of a published work (including material from the World-Wide Web) in a paper or exam answer without quotation marks and attribution of the source, submitting your own original work toward requirements in more than one class without the prior permission of the instructors, submitting a paper written by someone else, submitting as your own work any portion of a paper or research that you purchased from another person or commercial firm, and presenting in any other way the work, ideas, data, or words of someone else without attribution. These are punishable offenses whether intended or unintended (e.g., occurs through poor citations or confusion about how to reference properly).

You are encouraged to read additional texts and to discuss the issues of this course and your papers with others; but if you use ideas that come from others, you must acknowledge their help. It is always better to err on the side of acknowledging other people than to fail to do so. Other offenses against academic integrity include: collaborating with others on assignments without the express permission of the instructor, giving your work to another student to submit as his/her own, copying answers from another student or source materials during examinations, secreting or destroying library or reference materials. If you have any questions about how to cite sources, what constitutes appropriate use of a text, or other matters of academic integrity, please discuss them with your course instructor.

Anyone caught plagiarizing will fail the course. In addition, violations of academic integrity, including plagiarism, call for disciplinary action through the University.

- **Important Policies**
  - **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) Academic Program Manager Jess Cayer (jess.cayer@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
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=2765798&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).