MOVING IMAGE ARCHIVING AND PRESERVATION

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

Fall 2018
Thursday 10-5pm, room 643, 665 Broadway
(On most class dates, we meet 1-5, with additional mandatory lab and class sessions to be scheduled Thursdays 10-12 or alternate times. Some classes begin at 10am in the lab. See below for details.)

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

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 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

➢ 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://login.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/cinemaresouces.html

Class Goals:

After completing this course, you should:

• Understand the history of moving image formats and the conditions for their development
• Be able to identify a wide variety of moving image formats
• Understand the basics of film, video and audio systems
• Understand the physical properties of moving image media
• Be familiar with physical storage standards for various kinds of media
• Have mastered basic moving image media handling techniques and skills
• Have achieved basic moving image inspection and condition assessment skills
• Be familiar with a range of documentation/metadata schemes and tools
• Have demonstrated basic film repair skills

Class Sessions

Sept 6 Introduction
Sept 13 Film Formats
Sept 20 Video and Audio Formats / Audio for Film
Sept 27 Film Identification / Inspection and Documentation / Color Systems
Oct 4 Media Storage / Film Repair Techniques and Tools
Oct 11 Film Handling and Presentation: Projection and Optics
Oct 18 Audio History and Preservation / Capturing Metadata / Audio Format Identification
Nov 1 Video Preservation Issues
Nov 8 Film Preservation Issues
Nov 15 Student Presentations of Format and Process History
Nov 29 no class - AMIA Conference
Dec 6 Film Scanning / Film Access Copies Project
Dec 13 35mm Projection / Wrap Up

Sept 6 -- Introduction

Topics covered:

What is this class about?

Class participants’ backgrounds, skills and goals

Screening: Captain Celluloid Versus the Film Pirates, 1966, excerpt

Core Concepts

Audio Visual Systems
Analog versus Digital: Take One

Practice: Take a look at some examples of audio visual media

Important:
Sign up for one Bobst Library Research/Resources Session.

Sept 13 -- Film Formats

Assignments due before class:

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/
• Chronology of MP Films, Eastman Kodak.
• 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: Film 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 1-48. (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:
Choose written project topics in class.

Sept 20 -- Video and Audio Formats / Audio For Film

Assignments due before class:

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:
• Sarah Stauderman and Paul Messier, 2007, Video Format Identification Guide
• Timothy Vitale and Paul Messier, 2013, videopreservation.
• California Preservation Audiovisual format identification guide
• Texas Commission on the Arts Videotape Identification and Assessment Guide
• Tour of the Electromagnetic Spectrum, NASA Science.

Review:
• Pictorial History of Media Technology
• LabGuy’s World: Extinct Video Tape Recorder Related Links
• Museum of Obsolete Media
• Terra Media’s Chronology of Video

Optional--Watch and Listen:
• Sound Waves and Their Sources http://www.archive.org/details/SoundWavesAn
• Electromagnetism http://www.archive.org/details/electromagnetism
• Sound Recording and Reproduction (Sound on Film) http://www.archive.org/details/SoundRec1943

Optional--Read:
• VideoFreex, "Hardware," Spaghetti City Video Manual, pp. 3-27
• Ken Marsh, "Working the Big Works", Independent Video, pages 7-47.

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

**Screening:** *Discovering Cinema: Movies Learn to Talk*, 2004, Eric Lange and Serge Bromberg

**Practice:**

• Re-housing media
• Practice loading and transporting media

---

**Sept 27 -- Film Identification/Inspection and Documentation / Color Systems**

**Assignments due before class:**

**Read:**

• *Guide to Identifying Color Movie Film Stocks* by Paul Ivester.
• 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*.
• Weynand, Piccin and Weise, "Color Video", How Video Works, pp 53-68.
• Annette Melville, ed., The Film Preservation Guide:
  o *Film Handling and Inspection*,
  o *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)

**Topics covered:**

• Film Color
  o *Screening: Discovering Cinema: Movies Dream in Color*, 2004, Eric Lange/ Serge Bromberg
• Film Identification
  o Film Formats
  o Recognizing Film Element Type (release print, A/B rolls, negatives, etc.)
  o Recognizing basic film types (reversal vs. print from negative; kinds of sound tracks, etc.)
  o Film Edge Codes
• Film Inspection
  o Recognizing mechanical damage to film
  o Recognizing chemical/biological damage to film
• What is vinegar syndrome?
  o Using and reading AD strips

**Practice:**

• edge code reading exercise
• reading and setting up AD strip tests
• rewind practice

---

**Oct 4 -- Media Storage / Film Repair Techniques and Tools**

**Assignments due before class:**

**Read:**

• Screensound Australia, *Technical Preservation Handbook*
  o 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
• Peter Z. Adelstein, IPI Media Storage Quick Reference Guide, 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", the 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
  o Use of Shrinkage gauge
• Film Quality Assessment
  o Color quality, contrast, grain, resolution, sharpness
• Film Storage Issues
• Using 16mm film viewers
  o Table Top Viewers
  o Cinescan
  o Steenbeck
• Film Repair Techniques and Tools
  o hot splicers
  o tape splicers
  o Sprocket repair

Important:
Sign up for first film splicing practice time appointments.

Oct 11 -- Film Handling and Presentation: Projection and Optics

Assignments due before class:

Read:
• Leo Enticknap, "Exhibition and Presentation," Moving Image Technology, 132-158.

Topics covered:

• Inside a 16mm Projector
• Small gauge film projection practice

Important: Format History Outline due next week (10/18) before class begins, (approximately 2 pages)
The next class (10/18) meets at noon in the MIAP Lab

Oct 18 -- Analog Signal Errors / Audio History and Preservation

Class Meets at noon in the MIAP lab

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:
The next class (10/25) meets at 10:00am in the Bobst Library lobby
Sign up for audio digitization sessions with Blanche Joslin.
Format History Outline due before class (approximately 2 pages).

------------------------------------------------------------------------------------------------------------------


Class Meets at 10:00am - Bobst Lobby.
We will visit Digital Library Technology Services with Melitte Buchman, Digital Content Manager

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.
- Bobst Library Preservation-ViPIRS project: Manual for VHS/U-Matic
- Moving Theory into Practice: Digital Imaging Tutorial, Cornell University

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: scanning still images
Nov 1 -- Video Preservation Issues

Assignments due before class

Read:
- Johannes Gfeller, Agather Jarczyk, 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*

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

Important:
- *Class meets at 10am in the MIAP lab next class, November 8 / Cineric visit next week at 2pm.*

Nov 8 -- Film Preservation Issues

Class Meets at 10:00am in the MIAP lab

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
- Frye, Brian. *"The Accidental Preservationist: An Interview with Bill Brand"*, Film History 15:2 (2003), p 214
  - *The Curatorial Role*
  - *Duplication*
- Audio-Visual Working Group, 2016, *Digitizing Motion Picture Film: Exploration of the Issues*

Optional Reading
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:

Tour of Cineric Film Lab, Today, 2pm., 630 Ninth Avenue, Suite 508, between 44th and 45th Streets.
Class meets at noon next week, November 15
Format History paper and class presentations due next class meeting (Dec. 6th). Turn in digital copies of paper including bibliography and presentation before class begins.

Nov 15 -- Student Presentations of Format / Process History Project
Format History Papers must be delivered by the start of class; Class meets at noon.

Nov 29 -- No Class -- AMIA Conference

Dec 6 -- Film Scanning / Film Access Copies

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
- Digital Cinema

Class meets next week at 10am, room 648, 721 Broadway.
Dec 13 -- 35mm Projection / Low Budget Film Access Copies / Wrap Up

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

Assignments due before class:

Read:
- Cinema Studies Department 35mm Projection Manual
- AMIA Venue Assessment for 35mm Projection

Topics Covered:
- 10am Session – 35mm Projection
- 2pm Session – wrap up

Research Assignment

Examples of student work from 2006-2016

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.

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 footnotes organization: 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
- physical/chemical makeup and properties; file structure, platform requirements, compression, codec, etc.
  - (oxide used, track configuration, physical dimensions, housing, sprocket size and configuration, varieties of emulsion composition and characteristics, etc., as appropriate to the format/media)
  - If you are researching a process, provide a detailed description of how the process worked.
- associated playback devices or equipment
- competing formats / processes
- main user groups and use environments
- well known content associated with the format / process
- formats/processes that preceded and followed
- what, if any, technological capabilities were introduced on entry of the format / process into the market?
- what, if any, technological capabilities lead to the demise of the format / process in the market?
- known preservation issues/concerns

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 2/3rpm vinyl record (audio)
- Audioskopics
- Bernoulli Box (data storage)
- CD Video (CDV) (video)
- Digital-S / D-9 (video)
- Exabyte tape (data tape)
- film grading (timing) process and equipment (film)
- film recorder (film)
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 18. 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 6, at the beginning of class; In class presentation, December 6.

*Annotated Bibliography
https://owl.purdue.edu/owl/general_writing/common_writing_assignments/annotated_bibliographies/annotated_bibliographies.html

Contributors: Dana Bisignani, Allen Brizee

A bibliography is a list of sources (books, journals, websites, periodicals, etc.) one has used for researching a topic. Bibliographies are sometimes called "references" or "works cited" depending on the style format you are using. A bibliography usually just includes the bibliographic information (i.e., the author, title, publisher, etc.).

An annotation is a summary and/or evaluation.

Therefore, an annotated bibliography includes a summary and/or evaluation of each of the sources. Depending on your project or the assignment, your annotations may do one or more of the following:
- **Summarize:** Some annotations merely summarize the source. What are the main arguments? What is the point of this book or article? What topics are covered? If someone asked what this article/book is about, what would you say? The length of your annotations will determine how detailed your summary is.

- **Assess:** After summarizing a source, it may be helpful to evaluate it. Is it a useful source? How does it compare with other sources in your bibliography? Is the information reliable? Is this information biased or objective? What is the goal of this source?

- **Reflect:** Once you've summarized and assessed a source, you need to ask how it fits into your research. Was this source helpful to you? How does it help you shape your argument? How can you use this source in your research project? Has it changed how you think about your topic?

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) 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 (juanasa@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.