

## MOVING IMAGE ARCHIVING AND PRESERVATION

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

Fall 2017

Thursday 10-5pm, room 643, 665 Broadway

(many sessions will meet 1-5, but additional *mandatory* class sessions to be scheduled Thursdays at 10am; mandatory lab sessions will

be

scheduled Thursdays 10-12 or at alternate times)

Instructor: Ann Harris

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, Walflower Press
- How Video Works: From Analog to High Definition (3rd edition), Marcus Weise and Diana Weynand, 2016, Focal Press (page numbers from this edition. If you have the 2nd edition, I will give you alternate page numbers)
- 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 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 channel. If you still have trouble accessing an *NYU Classes* site, contact the IT Service Desk at 1-212-998-3333.
- Many of the texts not available online will also be on reserve at the Cinema Studies/MIAP Film Study Center, located on the sixth floor of 721 Broadway

#### 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 7	Introduction
Sept 14	Film Formats
Sept 21	Video and Audio Formats / Audio for Film
Sept 28	Film Identification/Inspection and Documentation / Color Systems
Oct 5	Media Storage / Film Repair Techniques and Tools
Oct 12	Film Handling and Presentation: Projection and Optics
Oct 19	Digital Images / Scanning Still Images / Video Format Identification, The Video Signal, Inspection, Assessment
Oct 26	Signal Errors / Audio History and Preservation / Capturing Metadata
Nov 2	Video Preservation Issues
Nov 9	Film Preservation Issues
Nov 16	Film Scanning / Film Access Copies Project
Nov 30	no class - AMIA Conference
Dec 7	Student Presentations of Format and Process History
Dec 14	35mm Projection / Wrap Up

## Sept 7 -- 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 14 -- 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.

- Section 2 (Film Specifics: Stocks and Soundtracks) of the [Home Film Preservation Guide](#)
- Annette Melville, ed., "[Understanding Film and How It Decays](#)", The Film Preservation Guide, San Francisco: The Film Preservation Foundation, 2004, pp 6-18.
- Leo Enticknap, "Film" and "Cinematography and Film Formats", Moving Image Technology, pp 4-73.

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 21 -- Video and Audio Formats / Audio For Film

Assignments due before class:

Read:

- Leo Enticknap, Moving Image Technology, pp. 98-131 and 159-186
- Weynand, Piccin and Weise, "Video Scanning", pp. 15-24; "Synchronizing Signals", pp. 25-33; "Recording and Storage Formats: Magnetic Recording", pp. 286-296.
- [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](#)

Review:

- [Pictorial History of Media Technology](#)
- LabGuy's World: [Extinct Video Tape Recorder Related Links](#)
- [Video Chronology](#)

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:

- VideoFreeex, "Hardware," Spaghetti City Video Manual, pp. 3-27
- Ken Marsh, "Working the Big Works", Independent Video, pages 7-47.
- Charles Bensinger, "A Grand Tour of Video Technology" and "The Video System", [Video Guide](#), 14-32.

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
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Sept 28 -- Film Identification/Inspection and Documentation / Color Systems

Assignments due before class:

Read:

- Leo Enticknap, "Colour," *Moving Image Technology*, pp. 74-97.
- [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*:
  - [Film Handling and Inspection](#),
  - [Film Condition Report](#), National Screen and Sound Archive, Australia,
- National Film and Sound Archive (Australia), [Film Identification and Handling](#), *Film Preservation Handbook*
- Kodak, [Handling Processed Film](#)
- [Shrinkage Measured](#), AMIA, 2003. (on AMIA page, scroll down to find the link, under Guidelines)
- [User Guide for AD Strips](#), Image Permanence Institute.

Topics covered:

- Film Color
  - Screening: *Discovering Cinema: Movies Dream in Color*, 2004, Eric Lange/ Serge Bromberg
- 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
  - rewind practice
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Oct 5 -- Media Storage / Film Repair Techniques and Tools

Assignments due before class:

Read:

- Screensound Australia, [Technical Preservation Handbook](#)
  - Condition Reporting
  - Photo Duplication: Image Quality

[Task Force to establish selection criteria of analogue and digital contents for transfer to data formats for preservation purposes](#), Click Publications -> IASA Publications and scroll down.

Read:

Assignments due before class

Class Meets at 10:00am to noon - Bobst Lobby.

Oct 19 -- Digital Images / Scanning Still Images / Video Format Identification, The Video Signal, Inspection and Assessment

**Important: Format History Outline due next week (10/19) before class begins, (approximately 2 pages)**

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

Topics covered:

- Leo Enticknap, "Exhibition and Presentation," Moving Image Technology, 132-158.
- Institute, 2006, pp. 57-62.
- Torkeil Saetervadedt, "Treatment of Archival Material," The Advanced Projection Manual, FIAF/Norwegian Film
- Edward Blasko, "Theatrical Projection," The Book of Film Care, Eastman Kodak Company, 1992, pp 62-69.
- [Public Access and Educational Use Task Force, 1994.](#)
- [Handling and Projecting 35mm Archive and Studio Prints: Voluntary Guidelines](#), National Preservation Board,

Read:

Assignments due before class:

Oct 12 -- Film Handling and Presentation: Projection and Optics

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

- 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

Topics covered:

- 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.
- Harold Brown, "Film Joins (Splices): Comments on Cement and Tape Splices," Technical Manual, FIAF Preservation Commission, 1985.

- 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](#).
- PrestoSpace [Magnetic Media Assessment Report](#), pp 9–42.
- Video Preservation Handbook, pp 7, section II.
- Bobst Library Preservation-ViPIRS project: [Manual for VHS/U-Matic](#)
- Stephen J. Marshall, "The Big Picture: Computer Graphics," *The Story of the Computer*, pages 353-395.
- [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
- Database versus Spreadsheet
- 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

**Important:**

**Format History Outline due before class (approximately 2 pages)**

## Oct 26 -- Analog Signal Errors / Audio History and Preservation

Assignments due before class:

Read:

- Sound Directions Publication, Read Chapter 4. "[Metadata](#)".
- Weynand, Piccin and Weise, "Audio For Video", pp. 203-219
- Bobst Library Preservation-ViPIRS project: [1/4" Audio Tape](#)

Review:

- [AES Audio Metadata Standards](#)

Topics Covered:

- Audio Tape history and tape structure
- Analog Signal Error
- Audio Preservation Workflow

Practice:

Practice loading and transporting various audio media

Practice collecting metadata for analog audio material

## Nov 2 -- Video Preservation Issues

Assignments due before class

Read:

- Film Preservation Issues: How do we differentiate among the terms preservation, conservation, restoration, reconstruction?

Topics covered:

- Optional Reading: Screen Sound Australia, [Photographic Duplication](#), Film Preservation Handbook.

- 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
  - Annette Melville, The Film Preservation Guide.
    - [The Curatorial Role](#)
    - [Duplication](#)
  - Leo Enticknap, "Archival Preservation," Moving Image Technology, pp. 187-201.
  - Audio-Visual Working Group, 2016, [Digitizing Motion Picture Film: Exploration of the Issues](#)

Assignments due before class

Class Meets at 10:00am in the MIAF lab

Nov 9 -- Film Preservation Issues

- **Important:** Class meets at 10am next class, November 17 / Cineric visit next week at 2pm.

- Video Cleaning techniques

Practice:

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

Screenings:

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

Topics covered:

- Luke Hones, Experimental Video Center, [Reel to Reel: A Case Study of BAVC's Remastering Model](#)
- 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?](#)
- Library of Congress, [Sustainability of Digital Formats: Planning for Library of Congress Collections](#)
- Chris Lacinak, [A Primer on Codecs for Moving Image and Sound Archives](#)
- Chris Lacinak, panel chair, AMIA/IASA 2010 • [Wappers and Codecs: A Survey of Selection Strategies](#)
- [A/V Artifact Atlas](#), BAVC
- Weyand, Pfcin and Weise, "Monitoring the Image", pp. 69-81; "Signal Monitoring", pp. 83-95, "Recording and Storage Formats"; pp. 275-286;
- American Society of Media Photographers, Video File Format Overview: <http://www.dpbestflow.org/Video Format Overview>

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

Dec 14 -- 35mm Projection / Low Budget Film Access Copies / Wrap Up

Format History Papers must be delivered by the start of class; Class meets at noon.  
Class meets next week at 10am, room 648, 721 Broadway.

Dec 7 -- Student Presentations of Format / Process History Project

Nov 30 -- No Class -- AMIA Conference

Class meets at noon on December 7.

Important:

Practice: scanning still images

- 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

Review:

- [METS primer.](#)
- [PBCore Metadata Dictionary and Guide.](#)
- [PREMIS](#)

Read:

- Department MWA Flashscan handbook on NYU classes
- [Preserving Early Motion Picture History with the Kinetta Archival Scanner](#)
- [Weiss, Picin and Weise, "The Encoded Signal", pp. 113-122; "Digital Theory", pp. 123-134, "Compression", pp 171-185, "Digital Scopes", pp 97-112.](#)
- [Torzell Saeterovodet, "Pixel—the Digital Picture Element,"\(17-29\) and "The DCP File Format," \(31-49\), FIAF Digital Projection Guide, 2012](#)

Assignments due before class:

Nov 16 -- Film Scanning / Film Access Copies

Tour of Cineric Film Lab, Today, 2pm., 630 Ninth Avenue, Suite 508, between 44th and 45th Streets.  
Format History paper and class presentations due next class meeting (Nov. 12<sup>th</sup>). Turn in digital copies of paper including bibliography and presentation before class begins. Class meets at 10am on November 16.

Important:

- What are some of the major issues with film preservation?
- What is the role of the film laboratory?
- Film Preservation--using digital means



## 2:00pm – The MIAP Lab

### Assignments due before class:

#### Read:

- Torkell Saetervadet, "Designing and Equipping a Cinema for the Presentation of Modern and Historic Films," *The Advanced Projection Manual*, FIAF/Norwegian Film Institute, 2006, pp. 11-56.
- Cinema Studies Department 35mm Projection Manual
- AMIA Venue Assessment for 35mm Projection

#### Topics Covered:

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

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*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.*

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## Research Assignment

### [Examples of student work from 2003-2016](#)

**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. Students must create an annotated\* bibliography and a detailed description/history that must include:

- time period for the format / process
- physical/chemical makeup and properties
  - (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 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):

- audio cassette
- Audioskopics
- early optical film printers
- film grading process and equipment
- film recorder
- Flexplay
- homemade film emulsions
- Laser Juke Box

- Magnecord
- Mail-A-Voice
- MicroMV
- Panavision
- Polychromide color process (film)
- polyester film stock
- Pulse Code Modulation
- Scanimate
- Sony 1 "EV
- The TV Typewriter

### Resource Suggestions:

- [Video Preservation Website](http://videopreservation.conservation-us.org/index.html), (http://videopreservation.conservation-us.org/index.html) Timothy Vitale and Paul Messier, updated 2013
- [The Pal Site](http://www.palsite.com/) (http://www.palsite.com/)
- [The American Widescreen Museum](http://www.widescreenmuseum.com/index.htm), (http://www.widescreenmuseum.com/index.htm) information on color processes, sound, as well as widescreen processes.
- **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%20mediatypetexts>). Hard copies of many issues available through the department Film Study Center
- Brown, **FIAF Technical Manual**
- Coe, **History of Movie Photography**
- Kattelle, **Home Movies: A History of the American Industry 1897-1979.**
- Ryan, **A History of Motion Picture Color Technology**
- Radical Software (1970 to 1974), <http://www.radicalsoftware.org/e/index.html>

**Due dates---Two page outline, October 19.** 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 7, at the beginning of class; In class presentation, December 7.**

**\*Annotated Bibliography** <http://owl.english.purdue.edu/owl/resource/614/01/>

**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 source 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.**

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**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.