

# CFRS 780

## Introduction to Digital Media Forensic Analysis

### Spring 2016

**Instructor:**

Eliud Bonilla: [ebonilla@gmu.edu](mailto:ebonilla@gmu.edu)

Office: Engr 3707

Hours: TBD

**Classes Meet:**

In Class Section

Day: Tuesday

Time: 7:20 PM – 10:00 PM

Room: Engr 1505

**Course Description:** This course will present an overview of digital multimedia (audio, images, video) forensic analysis. It will provide an introduction to methods, legal framework, software, hardware, analysis, and other aspects required for forensic/investigative examination.

**Course Goals:** By the end of this class, students will have a basic understanding of the underlying concepts of digital multimedia forensic investigations. They will have a basic framework for the full lifecycle of a media-based forensic investigation, from acquisition to technical analysis and reporting.

**Honor Code:** - The Mason Honor Code is in effect <http://oai.gmu.edu/honor-code/masons-honor-code/>

Student members of the George Mason University community pledge not to cheat, plagiarize, steal, and/or lie in matters related to academic work.

**Prerequisites:** Approval by TCOM/CFRS Director and working knowledge of a computer operating system.

**Course Schedule: (Subject to Change)**

Week	Date	Topic	Reading Assignments	Work Due
1	19 Jan	Foundational concepts and principles of media forensics	Notes from Blackboard	
2	26 Jan	Scientific perspectives – history, scientific method, statistics	Notes from Blackboard	Homework #1
3	2 Feb	Legal framework of media forensics – civilian, criminal, intelligence	Notes from Blackboard	Homework #2
4	9 Feb	Ethics & Bias	Notes from Blackboard	Homework #3
5	16 Feb	Basic principles on handling media evidence	Notes from Blackboard	Homework #4
6	23 Feb	Exam – In class, 1 hr timed, open book & notes. Semester project kickoff	Notes from Blackboard	
7	1 March	Audio – Introduction to acoustic and recording principles	Notes from Blackboard	
SPRING BREAK				
8	15 March	Audio – Survey of analytical techniques	Notes from	

			Blackboard	
9	22 March	Image – Introduction to general theory and engineering principles of cameras	Notes from Blackboard	Homework #5
10	29 March	Image – Survey of analytical techniques	Notes from Blackboard	
11	5 April	Video – Recording Principles	Notes from Blackboard	Homework #6
12	12 April	Video – Survey of analytical techniques	Notes from Blackboard	
13	19 April	Voice and facial identification	Notes from Blackboard	
14	26 April	Student teams present their media analysis project to class.		Project
15	3 May	Trends, challenges, and opportunities – What the future holds for the media expert/analyst		

**Grading:****Exam: 25% (Open Book and Notes)****6 Homeworks: 50%****Semester Project: 25%**

**Project:** There will be one media analysis project assigned during the semester. The students will participate in very small teams and apply different methods presented in class in order to authenticate a media file/s provided by the professor. A report with the findings and analysis notes will be required. More details will be provided in class.

**Exams:** The format of exam will be a combination of multiple choice, fill-in, and short answer questions.

**Online Lectures:** There will not be any online lectures for this semester.

**Mason Calendar:** <http://registrar.gmu.edu/calendar.html>

The above link will provide you with Mason's important dates and deadlines.

**Course Material:** All course material is available on Mason Blackboard.

How do you get on Blackboard?

- Go to: <https://mymasonportal.gmu.edu/webapps/portal/frameset.jsp>
- Login with your Mason Credentials
- Click on the Courses tab
- Click on the CFRS-TBD (Spring 2016) course

In order for Blackboard to work right, what do I need loaded on my computer:

- JAVA
- Quicktime
- Flash

**Thumb Drive (8 GB or higher)**

A Thumb Drive may be required for the semester project. This Thumb Drive will be returned to you after the project is graded.

**Software That You Will Need (Free Stuff)**

Software that you should have loaded on your personal computer include

- |                                   |   |
|-----------------------------------|---|
| -ExifTool by Phil Harvey          | <a href="http://www.sno.phy.queensu.ca/~phil/exiftool/">http://www.sno.phy.queensu.ca/~phil/exiftool/</a> |
| -JPEGsnoop                        | <a href="http://sourceforge.net/projects/jpegsnop/">sourceforge.net/projects/jpegsnop/</a>                |
| -VirtualDub                       | <a href="http://www.virtualdub.org/">http://www.virtualdub.org/</a>                                       |
| -Audacity                         | <a href="http://audacity.sourceforge.net/">http://audacity.sourceforge.net/</a>                           |
| -Catalina Forensic Audio Software | <a href="http://www.forensicav.ro/software.htm">http://www.forensicav.ro/software.htm</a>                 |
| -WinHex                           | <a href="http://www.winhex.com/winhex/">http://www.winhex.com/winhex/</a>                                 |
| -Wavesurfer                       | <a href="http://sourceforge.net/projects/wavesurfer/">http://sourceforge.net/projects/wavesurfer/</a>     |
| -Others                           | TBD   |

**Lab Computers** – In class we will be using lab computers. **Please make sure that your computer is working properly prior to the start of class.**

**Required Reading and Reference Material:** Multiple books and sources are used to create this course. No one book is a required text, notes and reading materials will be provided for most classes.

**Optional:** Law for the Expert Witness, 4th Edition; Daniel A. Bronstein; CRC Press, 2011; ISBN 978-1439851562 (**Bronstein**)

**Optional:** CCTV, Third Edition: From Light to Pixels, 3<sup>rd</sup> Edition; Vlado Damjanovski; Butterworth-Heinemann, 2013; ISBN 978-0124045576 (**BH**)

**Optional:** The Psychology of Intelligence Analysis; Richards J. Heuer; Pherson Associates, 2007; ISBN TBD (**Heuer**)

**References from the Web include the following sites:**

Scientific Working Group on Digital Evidence: <https://www.swgde.org/>

Scientific Working Group on Imaging Technology: <https://www.swgit.org/>

Audio Engineering Society: <http://www.aes.org/>

National Institute of Standards and Technology, Organization of Scientific Area Committees:

<http://www.nist.gov/forensics/osac/index.cfm>

**Students with disabilities who seek accommodations in a course must be registered with the GMU Office of Disability Services (ODS) and inform the instructor, in writing, at the beginning of the semester. See <http://www2.gmu.edu/dpt/unilife/ods/> or call 703-993-2474 to access the ODS.**

**Note: ALL STUDENTS MUST HAVE A GMU EMAIL ACCOUNT AND HAVE ACCESS TO <https://mymasonportal.gmu.edu>**

**ALL COMMUNICATION WILL BE THROUGH GMU EMAIL AND NOT BLACKBOARD EMAIL OR ANYOTHER EMAIL ACCOUNT**