DIGITAL FORENSICS
INFORMATION ASSURANCE

COURSE SYLLABUS
DFIA 448- Forensic Image & Video Analysis
CRN: 1902-3 CR HRS.

Instructor:	Prof. Josh Brunty	**Class Meets:**	MWF 9:00-9:50AM
Office:	WAEC 2001	**Classroom:**	WAEC 1232
Phone:	304-696-5602	**Office Hours:**	MWF 10:00-11:00AM
Email:	josh.brunty@marshall.edu		TR 9:30-11:00AM

Course Description (from catalog):

Course will introduce principles of forensic image and video analysis and their application to digital forensics. Practical forensic enhancement and analysis techniques, including how to prepare forensically sound exhibits, are covered.

More Description:

This Forensic Image & Video Analysis course is intended to provide the student with the basic use of digital images and digital video in a forensic setting. This includes the use of best practices to exceed the requirements of court, utilizing various industry standard tools such as Adobe Photoshop and other commonly used software tools, and developing a workflow from archiving to courtroom testimony. Students will be provided methodology to perform imaging tasks that are commonly faced in the digital forensics community today.

Course Format:

Class will meet on Monday, Wednesday, and Friday each week from 9:00-9:50AM, unless otherwise specified by the instructor or course schedule. Materials will be presented using lectures, in-class discussions, and class projects and presentations. Students will be expected to attend class and participate in class discussions, complete laboratory assignments, and take in-class quizzes and exams.

Required Texts, Additional Reading, & Other Materials:

- No Required Texts
- Recommended Texts:
  - Russ, J. *Forensic uses of Digital Imaging*. ISBN#: 978-1498733076
  - Reis, G. *Photoshop CS3 For Forensic Professionals.* ISBN#: 978-0470114544
- Students will need to create Tophat user account and purchase a Tophat subscription plan for use within this course. Subscription plans vary from 4 month access, semester access, to lifetime access. Tophat can either be purchased online or through MU Bookstore. Tophat will be used to track attendance, class quizzes, reviews, etc. The join code for this course is 754096 and the course homepage is https://app.tophat.com/e/754096 Tophat can be used from either a PC or via the Android/iOS app on a mobile device. Students can also text-in answers to +1 (315) 636-0905 via SMS. This is ideal for poor wifi or older mobile devices.

- This course is designated as an upper level digital forensics course, with much of the learning focused around hands-on learning. In this course we use tools that are part of the Adobe Creative Suite (specifically Adobe Bridge and Photoshop) and other additional plugins that you will be required to have for the course (i.e. ClearID). Adobe software is available on any on-campus machines at Marshall University or you can purchase a subscription to Adobe's Creative Cloud (http://www.adobe.com/creativecloud/buy/students.html). We will be configuring your machines in WAEC 1232 specifically for use in this course. You can also access the Adobe Creative Suite off-campus through MURemote (https://muremote.marshall.edu)
- Assigned readings and laboratory exercises are an essential component of this course and provide students with a baseline of knowledge that will be expanded upon through more detailed and complex in-class lectures and discussions. Students will be required to complete assigned readings prior to the class period in which the material will be discussed.
- Supplemental course materials (e.g., handouts, reading assignments, lab exercises, etc.) will be posted to the MUOnline http://www.marshall.edu/muonline

Desired Objectives/Outcomes:

This course is designed to apply the concepts of digital forensic analysis to that of forensic image analysis and enhancement. This course places a strong emphasis on digital forensic procedures, digital forensic tools, and legal issues relating to digital imaging and forensic video analysis. This course uses advanced forensic tools and hands on exercises to emphasize the procedures that students will utilize in the field as forensic investigators.

In this course, learning outcomes are gauged as followed:

Course Student Learning Outcome	How Practiced in This Class	How Assessed in This Course
• Identify and define professionally and legally accepted methodologies, standards, and best practices for the forensic processing of video and image evidence.	• Identification and explanation of SWGDE, SWGIT, LEVA, and NIST standards and best practices.	• Completion of Module 1- Introduction to Forensic Image & Video Analysis, Exam 1, Laboratory Project 1
• Analyze and apply the correct forensic tool, technique, or methodology to enhance, archive, and print a digital mage without compromising its authenticity as evidence. Analyze and apply the correct advanced tool, technique, or	• Application of various forensic enhancements to forensic images using various forensic tools and software	• Completion of Module 2- Forensic Image Analysis, Exam 1, Laboratory Project 2

methodology to enhance, archive, and print a digital mage without compromising its authenticity as evidence		
• Analyze and properly apply the correct forensic tool, technique, or methodology to enhance, investigate, and generate/render enhanced video evidence without compromising its authenticity as evidence	• Application of various advanced-level forensic enhancements to forensic video using various forensic tools and software	• Completion of Module 3- Forensic Video Analysis, Exam 2, Laboratory Project 3
• Compare and contrast image and video evidence utilizing scientific methodologies, standards, and best practices.	• Comparison of questioned vs. known images and patterns and articulating findings of that comparison.	• Completion of Module 4- Forensic Image & Video Comparison, Exam 2, Laboratory Project 4
• Develop and articulate forensic image and video enhancements and comparisons in a forensic report format. • Construct a courtroom presentation that is legally acceptable in a court of law	• Creation of a comprehensive forensic report that adheres to certain forensic best practices and standards. • Construction of a courtroom presentation that illustrates forensic comparisons made in an investigation	• Completion of Module 5- Forensic Reporting & Courtroom Presentations- Putting it All Together, Exam 2, Final Laboratory Project

University Policies:

By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/policies/

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Attendance Policy and Make-up Work:

This class is predominately project based, with much of our time devoted to class time computer work and hands-on tutorials with forensic tools and other plugins that are only available in the laboratory environment. With that said, any missed classes will result in lost points (5 pts. per class), put the student behind, and make it difficult to pick up with the next class lessons. In-class participation is an essential component of this course and students will be expected to attend each class unless they have a valid university-approved excuse (see university excused absence policy). I will be happy to meet with students who miss class with a valid excuse to discuss course material and how missed work can be made up. However, I will not re-lecture to students who miss class during office hours, and it will be the students' responsibility to catch up on missed material (e.g., readings, in-class labs, etc.).

Assignment Submission & Late Policy:

The course includes a number of projects and assignments. All assignments are due on their due date and must be submitted through via MUOnline (unless otherwise noted by the instructor). NO LATE ASSIGNMENTS WILL BE ACCEPTED. Please do not procrastinate in working on your assignments or trying to submit through MUOnline as many others have done in the past. If you wait until the last night to start on the project or the last minute to submit, chances are, you will fail. Most Laboratory Projects are due by Friday @ 11:59PM

All electronic submissions MUST follow this file naming convention:
DFIA448_LastName_FirstInitial_Assignment Name.extension.
("DFIA448_brunty_j_project1.ext")

Assignments must be submitted in the format specified by the instructor for a given assignment. I WILL NOT accept projects submitted in non-approved formats or naming conventions.

Course Requirements & Grading Policy:

Student materials and grades will be returned as soon as graded to the student and can be viewed via MUOnline. Should you wish to appeal a grade, test question, etc, you need to follow this procedure. You should send an email via MUOnline to the Graduate Assistant and CC me. The title of the email must read "GRADE APPEAL – Assignment Name" (i.e. Lab Project 1, Exam 1, etc). The body of the email must include the question, question number, your answer, and why you think you deserve credit. For tests and quizzes in MUOnline, this should be done immediately after completion, before you leave class. You can copy and paste this information to make things simple. I will get back to you as soon as possible.

Students will be evaluated in this course based on their performance in the following categories:

Laboratory Projects (50%) – There are a total of five (5) laboratory projects due during this course. Every Module (with the exception of the Introduction (Module 0) has an associated laboratory project. These projects due dates are on the Module due date (see below) and are available in MUOnline when posted. Laboratory projects 1-4 are worth 50 points. The Final Laboratory Project is worth 100 points.

Exams 1 & 2- (40%) – There are a total of two (2) exams administered during the semester (please see syllabus for exam date). Each of these exams will be worth 100 points. Study guides will be given in advance of each exam. Any student who misses this exam due to an unexcused absence will receive a 0% for that exam (see make-up exam policy).

Attendance & In-Class Quizzes/Labs (10%)- Attendance will be taken each day of class via Tophat. It is the student's responsibility to make sure that the sheet is signed. Each class will be worth five (5) points. and will be calculated as a score at the end of the semester. Any in-class quizzes or assignments given by the instructor will also factor into this percentage calculation

The above categories will be graded as follows:

Laboratory Exercises	50%
Exams 1 & 2	40%
Attendance/In-Class Labs	10%
Total	**100%**

This class will employ a weighted grading system. To determine your grade in this course, fill in your percentage score for each evaluation category below, multiply each score by its weight, and then add the values in the final grade column to find your overall grade out of 100. In addition to handing graded assignments back to you in class, I will post grades for individual assignments and exams on blackboard. However, please remember that you **must** use the weighted grading system shown below to determine an accurate portrayal of your overall course grade. I am happy to meet with you to discuss your course progress/grade during office hours throughout the semester.

Evaluation Category	Your Score (Out of 100)	Weight	Contribution to Final Grade
Laboratory Exercises (average)		X .50 =	
Exam #1		X .20 =	
Exam #2		X .20 =	
Attendance/In-Class Labs/Quizzes (average)		X .10 =	
Final letter grades are calculated using the following scale: 90-100 A 80-89 B 70-79 C 60-69 D Below 60 F		**Final Grade (out of 100)**	

There will be a number of out-of-class labs and hands-on assignments as part of this course. As such, you will be given card access to the Digital Forensics Laboratory (WAEC 1232) to work on assignments and practice labs when classes aren't in session. Open lab schedules will be posted during the first or second week of classes. If you do not have an RFID-enabled access card you can obtain your first one free-of-charge from the campus ID office located on the first floor of Drinko Library. In addition, you will also need to complete the required COS IT Conduct form before the end of the first week of classes online by visiting http://www.marshall.edu/cosweb/agreements/?a=j3qw3 Usage of the computers and course files will not be permitted until the online form is completed.

Communication:

I will post course content on MUOnline (e.g., syllabus, assignments, readings, etc.), so be sure to check for new materials regularly. Your MU e-mail address will be used to make any general

announcements, last minute schedule changes, etc. I recommend that you monitor your MU email and MUOnline accounts at least once a day. Also, I will only respond to emails that you send me from your official MU email address – it is the only way for me to be sure that I am responding to you (and not someone else pretending to be you).

Classroom Learning Environment:

To foster the best possible environment for learning, we will follow "Brunty's Maxims" They are as follows:

- ✓ *Don't Lie…*
- ✓ *Don't Cheat…*
- ✓ *Don't Steal…*
- ✓ *Don't play on your cellphone unless directed to do so.*
- ✓ *Don't have conversations that distract the class.*
- ✓ *Don't disparage other students- Treat everyone with respect.*
- ✓ *Don't be late for class*
- ✓ *ALWAYS be professional. Take advantage of your time here. Ask questions. Participate.*

Students who violate these maxims will be asked to leave class.

Course Schedule and Due Dates:

NOTE: This is a tentative schedule and it may change as the class progresses. Due dates for Lab Projects are listed in the notes section.

Date	Day	Topic	Notes
8/21	M	Module 0 (Course Introduction)	
8/23	W	Module 1 (Introduction to Forensic Image & Video Analysis- Terminology & Legal)	
8/25	F	Module 1 (Introduction to Forensic Image & Video Analysis-Terminology & Legal)	
8/28	M	Module 1 (Introduction to Forensic Image & Video Analysis-Intro to Adobe Bridge)	
8/30	W	Module 1 (Introduction to Forensic Image & Video Analysis-Intro to Photoshop for Forensics)	
9/1	F	Module 1 (Introduction to Forensic Image & Video Analysis-Intro to Photoshop for Forensics & Image Geolocation)	✓ Lab Project 1 Distributed
9/4	M	**No Class- Labor Day Holiday**	
9/6	W	Module 2 (Forensic Image Analysis- Basic Enhancements)	
9/8	F	Module 2 (Forensic Image Analysis- Basic Enhancements)	✓ Lab Project 1 DUE @ 11:59PM via MUOnline
9/11	M	Module 2 (Forensic Image Analysis- Advanced Enhancements)	

9/13	W	Module 2 (Forensic Image Analysis- Advanced Enhancements)	
9/15	F	Module 2 (Forensic Image Analysis- Advanced Enhancements)	
9/18	M	**No Class- Out for Conference**	
9/20	W	**No Class- Out for Conference**	
9/22	F	Module 2 (Forensic Image Analysis- Advanced Enhancements)	✓ Derbycon 7.0 (Louisville, KY 9/20-24
9/25	M	Module 2 (Forensic Image Analysis- Advanced Enhancements)	
9/27	W	Module 2 (Forensic Image Analysis- Advanced Enhancements)	
9/29	F	Module 2 (Forensic Image Analysis- Advanced Enhancements) Exam 1 Review	✓ Lab Project 2 Distributed ✓
10/2	M	**Exam #1**	
10/4	W	Module 2 (Forensic Image Analysis- Forensic Photography)	
10/6	F	Module 2 (Forensic Image Analysis- Forensic Photography)	
10/9	M	Module 3 (Forensic Video Analysis)	
10/11	W	Module 3 (Forensic Video Analysis)	
10/13	F	Module 3 (Forensic Video Analysis)	✓ Lab Project 2 DUE @ 11:59PM via MUOnline
10/16	M	Module 3 (Forensic Video Analysis)	
10/18	W	Module 3 (Forensic Video Analysis)	
10/20	F	Module 3 (Forensic Video Analysis)	
10/23	M	Module 3 (Forensic Video Analysis)	
10/25	W	Module 3 (Forensic Video Analysis)	
10/27	F	Module 3 (Forensic Video Analysis)	✓ Lab Project 3 Distributed
10/30	M	Module 4 (Forensic Image & Video Comparison)	
11/1	W	Module 4 (Forensic Image & Video Comparison)	
11/3	F	Module 4 (Forensic Image & Video Comparison)	
11/6	M	Module 4 (Forensic Image & Video Comparison)	
11/8	W	Module 4 (Forensic Image & Video Comparison)	
11/10	F	Module 4 (Forensic Image & Video	✓ Lab Project 4

		Comparison) Exam 2 Review	Distributed ✓ Lab Project 3 DUE @ 11:59PM via MUOnline
11/13	M	**Exam #2**	
11/15	W	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	
11/17	F	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	✓ Hackercon/SecureWV 11/17-19 (Charleston, WV)
11/20	M	**No Class- Thanksgiving Holiday**	
11/22	W	**No Class- Thanksgiving Holiday**	
11/24	F	**No Class- Thanksgiving Holiday**	
11/27	M	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	
11/29	W	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	
12/1	F	Final Project Briefing	✓ Lab Project 5 (Final Project) Distributed ✓ Lab Project 4 DUE @ 11:59PM via MUOnline
12/4	M	**No Class- Instructor Travel**	
12/6	W	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	
12/8	F	Module 5 (Forensic Reporting & Courtroom Presentations- Putting it all Together)	
12/14	TR	**Final Presentations due @ 11:59PM via MUOnline**	
12/15	F	**Final Presentations (Friday 12/15 8:00AM-10:00-AM)**	