



FORENSIC SCIENCE

COURSE SYLLABUS **FSC 676- Advanced Digital Evidence Detection & Recovery** **CRN: 3297- 2 CR HRS.** **Spring 2025**

Instructor:	Dr. Josh Brunty <small>MCFE</small>	Class Meets:	M 0800-0950AM
TA:	Christopher Vance <small>MCFE</small>	Classroom:	WAEC 2237
Office:	Forensic Science Ctr. W200G	Office Hours:	M- 1:00-2:00PM WF- 10:00-11:00AM T & TR 9:30-11AM
Phone:	304-691-8962		Book a Meeting with Me
Email	josh.brunty@marshall.edu christopher.vance@marshall.edu		

Course Description (from catalog):

This course will provide an overview of the advanced procedures and techniques used by investigators working with digital evidence. The course will be taught as a combination of lectures, laboratory, and practical exercises.

Course Format:

Class is scheduled to meet on Monday each week from 8:00-9:50AM in WAEC 2237 (Advanced Cyber Forensics Lab) unless otherwise specified by the instructor or course schedule. Materials will be presented using lectures, in-class discussions and demonstrations, and class projects and presentations. Students will be expected to attend class and participate in class discussions, complete written assignments, and take in-class quizzes and exams.

Required Texts, Additional Reading, & Other Materials:

- Magnet AXIOM Academic Manual (Provided by instructor)
- A course OneDrive link has also been setup at: <http://bit.ly/advanced-de-onedrive> This OneDrive link contains course-related software & files. Most of these files can also be found locally on machines in WAEC 1232 & 2237 in the **CFS Class Files** folder on the root of the C:// drive.

- Magnet forensic software will be available only on the machines in WAEC 1232 & 2237 (Digital Forensics Laboratory). We will be configuring your machines in WAEC 1232 (Digital Forensics Laboratory specifically for use in this course.
- Assigned readings 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, etc.) will be posted to the Microsoft Teams/OneDrive. You can access the course teams page by clicking [HERE](#)

Desired Objectives/Outcomes:

This course is designed to apply the concepts of advanced analysis techniques to digital evidence. 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.

Course Student Learning Outcome	How Practiced in This Class	How Assessed in This Class
✓ Students will be knowledgeable in recovering evidence from various digital media types	✓ In-class lecture & hands on laboratory exercises.	✓ Classroom Discussion, End of Module Exercises, In-Class Laboratory Exercises, Student Semester Project, Final Exam
✓ Students will be familiar with components of advanced hardware and software systems used in a digital forensics laboratory.	✓ In-class lecture & hands on laboratory exercises.	✓ Classroom Discussion, End of Module Exercises, In-Class Laboratory Exercises, Student Semester Project, Final Exam
✓ Students will be acquainted with advanced methods used to recover, examine, and complete case reports pertaining to digital evidence.	✓ In-class lecture & hands on laboratory exercises.	✓ Classroom Discussion, End of Module Exercises, In-Class Laboratory Exercises, Student Semester Project, Final Exam
✓ Students will be confident in analyzing and examining digital evidence that will stand up to standards required for criminal and/or civil cases.	✓ In-class lecture & hands on laboratory exercises.	✓ Classroom Discussion, End of Module Exercises, In-Class Laboratory Exercises, Student Semester Project, Final Exam

✓ Students will obtain knowledge that will allow successful completion of the Magnet Forensics Certified Examiner AXIOM (MCFE-AXIOM) certification.	✓ In-class lecture & hands on laboratory exercises.	✓ Classroom Discussion, End of Module Exercises, In-Class Laboratory Exercises, Student Semester Project, Final Exam
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University Policies

By enrolling in this course, you agree to the University Policies. Please read the full text of each policy (listed below) by going to MU Academic Affairs: University Policies. (URL: <http://www.marshall.edu/academic-affairs/policies/>)

- Academic Dishonesty Policy
- Academic Dismissal Policy
- Academic Forgiveness Policy
- Academic Probation and Suspension Policy
- Affirmative Action Policy
- Dead Week Policy
- D/F Repeat Rule
- Excused Absence Policy for Undergraduates
- Inclement Weather Policy
- Sexual Harassment Policy
- Students with Disabilities (Policies and Procedures)
- University Computing Services Acceptable Use Policy

Attendance Policy and Make-up Work:

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 exercises, etc)

Assignment Submission & Late Policy:

All homework & in-class issued assignments must be turned in **on or before** the specified due date. Except under special circumstances with written justification, assignments turned in after the due date will be penalized with a 10% reduction in points for each day late, including Saturdays and Sundays (i.e., one day late = 90% highest possible score, two days late = 80% highest possible score, etc.). Assignments will not be accepted more than one week after the original due date.

In-class quizzes and lab assignments will not be accepted late (i.e., there will be no opportunity to make up any missed in-class quizzes or lab exercises), except under special circumstances with written justification and prior approval. If your absence is unexcused, you will not be given an opportunity to make up any missed in-class assignments. In order to receive an excused absence, you must visit the office of academic affairs to obtain a written excused absence form. Due dates are outlined in the course schedule below.

Course Requirements & Grading Policy:

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

In Class Labs/Exercises (30%) – Students will be required to complete several hands-on lab exercises during class in addition to completing the questions found at the end of each module. These labs & questions will be essential for demonstrating how to conduct mobile forensics examinations in a laboratory environment in addition to gaining tool competency. Attendance administered each class. Lab exercises must be completed during class. Late or make-up labs will not be accepted, except under special circumstances with written justification. Students are required to attend and actively participate in each class throughout the semester. Students are also expected to complete reading assignments prior to the class period in which the materials will be discussed. In order to assess compliance with these expectations, I will be administering several unannounced, in-class quizzes related to course material at random throughout the semester. Students who miss a class period without having a university and/or department pre-approved excused absence will receive a score of zero for any quiz given during that class period. This policy will be beneficial to students who complete readings and attend class on a regular basis.

Practical Case Report (30%) – Students will be required to complete a practical hands-on case report scenario which will test the tools, techniques, and competencies learned throughout the semester. The files, scenario, and instructions for this project can be found in the course OneDrive. This project will be assigned in the 3rd week of class and can be worked on by students throughout the semester. Students will create and submit a final investigative report as part of this project.

Final Exam (40%) – Students will be given the opportunity to apply for & complete the Magnet Certified Forensics Examiner (MCFE-AXIOM) certification which will serve as the final exam during the course of the semester. Qualification is at the sole discretion of Magnet Forensics (as it is an external test) but this course (FSC 676) has been acceptable training prerequisite due to Marshall University's Academic Partnership with Magnet Forensics. Students will complete the application process by visiting <http://www.magnetforensics.com/certifications>. It is recommended that the student completes the formal application process no later than 30 days before the end of the semester in order to allow time for approval. Once approved you will have 2 opportunities to take and pass the exam (80% or better) before having to wait 60 days to retake. Successful passing of the MCFE-AXIOM exam of 80% or better prior to the end of the

semester will earn the full 50% weighted grade (regardless of the grade earned). For more information regarding the MCFE please visit <http://www.magnetforensics.com/certifications>.

The above categories will be graded as follows:

In Class Labs/Exercises	30%
Practical Case Report	30%
Final Exam	40%
Total	100%

Evaluation Category	Your Score (Out of 100)	Weight	Contribution to Final Grade										
In-Class Labs/Exercises (average)		X .30 =											
Practical Case Report		X .30 =											
Final Exam		X .40 =											
Final letter grades are calculated using the following scale:		Final Grade (out of 100)											
<table border="1"> <tr> <td>90-100</td> <td>A</td> </tr> <tr> <td>80-89</td> <td>B</td> </tr> <tr> <td>70-79</td> <td>C</td> </tr> <tr> <td>60-69</td> <td>D</td> </tr> <tr> <td>Below 60</td> <td>F</td> </tr> </table>		90-100	A	80-89	B	70-79	C	60-69	D	Below 60	F		
90-100	A												
80-89	B												
70-79	C												
60-69	D												
Below 60	F												

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 Teams. 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.

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 access privileges to the Digital Forensics Laboratories (WAEC 1232

& 2237) 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. You can also visit the ID office to enable RFID access on a companion mobile device (i.e. Apple Watch or iPhone) if compatible. 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 <https://netapps.marshall.edu/cosweb/agreements/?a=cositconduct>. Usage of the computers and course files will not be permitted until the online form is completed.

Communication:

I will post course content to the course Teams page and the course OneDrive (e.g., syllabus, assignments, readings, lectures, 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 & the course Teams page 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).

If you need to schedule an office-hours appointment with me (career guidance, help with lab projects, etc.) you can stop by during my office hours or you can schedule an appointment with me anytime by visiting my Bookings page [HERE](#).

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 and/or classes are cancelled. Lab Projects, etc. are listed in the notes section. The official MU Academic Calendar can be found at: <https://www.marshall.edu/academic-calendar/>

Week 1- Course Introduction & Magnet Axiom Installation (1/13)	
Required Readings	Module 1- Course Introduction & Magnet Axiom Installation (pp. 4-19)

Continued on next page

Week 2- No Class (1/20)	
Note	No Class- Martin Luther King Jr. Holiday
Week 3- Evidence Processing & Case Creation (1/27)	
Required Readings	Module 2: Evidence Parsing & Case Creation (pp. 20-68)
Week 4- Operating Systems Part I (2/3)	
Required Readings	Module 3: Operating System- Part 1
Week 5- Encryption & Credentials (2/10)	
Required Readings	Module 4: Encryption & Credentials (p. 99)
Week 6- Refined Results (2/17)	
Required Readings	AAFS- No Class
Week 7- No Class (2/24)	
Note	Module 5: Refined Results (p. 111)
Week 8- Web Related & Email (3/3)	
Required Readings	Module 6: Web-Related (p. 146) Module 7: Email & Calendar (p. 190)
Week 9- Documents & Media (3/10)	
Required Readings	Module 8: Documents (p. 205) Module 10: Media (p. 263)
Week 10- Operating System- Part 2 (3/17)	
Required Readings	No Class- Spring Break
Week 11- Spring Break (3/24)	
Note	Module 9: Operating System- Part 2 (p.227)
Week 12- iOS Analysis (3/31)	
Required Readings	Module 11: iOS Analysis (p. 303)
Week 13- Android Analysis (4/7)	
Required Readings	Module 12: Android Analysis (p. 360)
Week 14- iOS & Android (Cont.)	
Required Readings	Modules 11 and 12
Week 15- Cloud & RAM (4/21)	
Required Readings	Module 15: Reporting (p. 452)
Week 16- Dead Week (4/28)	
Required Readings	o Module 15: Reporting (p. 452)
Week 17- Finals Week (5/5)	
Note:	o MCFE Exam Submission DUE by midnight 5/9 via Blackboard o Final Semester Practical Case Report DUE by midnight 5/9 via Blackboard

About Your Professor:

I am an Associate Professor in the School of Forensic & Criminal Justice Sciences at Marshall University and have been since 2012. My teaching & research expertise is in digital forensics, mobile device forensics, network forensics, and multimedia forensics. I am a Fellow of the [American Academy of Forensic Sciences \(AAFS\)](#), an appointed member & Executive Secretary of the [NIST Organization of Scientific Area Committee \(OSAC\) on Digital Evidence](#), Commissioner of [FEPAC](#) & a member of [ASTM E30 Committee on Forensic Sciences](#). I am also an Editorial Board Member of the [Journal of Forensic Sciences](#). Prior to entering academia, I managed digital forensic casework & research laboratories at the [Marshall University Forensic](#)

[Science Center](#) and also worked as an examiner with the [West Virginia State Police's Digital Forensic Unit](#). I also worked as a Technical Assessor for the [ANAB](#) assessing digital forensics laboratories throughout the US seeking ISO accreditation. I am graduate of the FLETC [Seized Computer Evidence Recovery Specialist \(SCERS\)](#) program, a certified [Computer Hacking Forensic Investigator \(CHF1\)](#), a [Magnet Certified Forensics Examiner \(MCFE\)](#), a [LEVA Certified Forensic Video Technician \(CFVT\)](#), a [Cellebrite Certified Mobile Examiner \(CCME\)](#), & [GIAC Advanced Smartphone Forensics \(GASF\)](#) certified.

A more detailed background, including my past work & research, can be found at:
<https://solo.to/joshbrunty>

You can also follow me on X: [@joshbrunty](#) or LinkedIn: <https://linkedin.com/in/joshbrunty>