Syllabus

College of Computing and Computer Engineering

Department of Computer Science

CSCE 4555/5555: Computer Forensics

Fall 2026 Section 001, 201, 202

Instructor Information

Instructor:	Dr. James E. Freedle II	Teaching Assistant:	Asrar Ali H Qassem
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Course Description, Structure, and Objectives

CSCE 4555/5555, covers the security goals, threats and vulnerabilities, Cryptography, program security and operating system security issues. Basic network security, planning, policies, and risk analysis. The class will be an in person face to face class.

Course Learning Outcomes

1. Demonstrate general knowledge and comprehension of computer forensics and computer investigations.
2. Describe and explain the Windows, Macintosh, and Unix/Linux operating systems data storage and methodologies.
3. Describe and explain the methods used for digital evidence control, processing crime and incident scenes, and data acquisition for computer forensics analysis.
4. Demonstrate knowledge and comprehension of basic tools and techniques used in the field of computer forensic sciences
5. Describe and explain writing investigation reports and being an expert witness.

Course Requirements and Assignments

The first 8 weeks we will focus on the ethical documentation of reports, paperwork and investigator requirements to present evidence, and most importantly some of what might be considered "trivial" but necessary components of everyday forensics work. This first 8 weeks will be drawn mostly from the Digital Forensics and Host Forensics sections below.

The second 8 weeks we will shift our focus onto the technical aspects of forensics. Labs will be integrated into this portion of the course. We will start with the basics, comparing files for anomalies, then onto working in both Windows and Linux. We will have multiple labs using both windows and Linux platforms (you will be required to work in both Operating Systems). Each lab will require you to submit a verification that you completed the work without assistance, explain how you completed the lab, and finally what you understood from the assignment. The labs will be drawn mostly from the Media Forensics components listed below.

We have multiple sets of outcomes for this CSCE 4555 (Computer Forensics) and we will focus from very broad to very specific objectives within the course. In this 16-week (5 module) lecture/lab course, we will use a “flipped” classroom, meaning students are responsible for reading the assigned chapters prior to attending class (first meeting) so that they will be prepared for the class “notes” more importantly to ask pertinent questions to clarify content in a meaningful way. During the 2nd half of each module (second meeting), students should come to class having completed the labs, or have specific questions to clarify work within the labs. Discussion questions will be discussed in class to identify specific topics associated with various modular topics tied to

forensics. We will focus on the catalog description as well as three NSA KU (Knowledge Units); Digital Forensics (DFS), Host Forensics (HOF), and Media Forensics (MEF).

Digital Forensics (DFS)

To complete this KU, all Topics and sub-Topics must be completed:

1. Legal Compliance
    1. Applicable Laws
    2. Affidavits
    3. How to Testify
    4. Case Law
    5. Chain of custody
2. Digital Investigations
    1. E-Discovery
    2. Authentication of Evidence
    3. Chain of Custody Procedures
    4. Metadata
    5. Root Cause Analysis
    6. Using Virtual Machines for Analysis

Host Forensics (HOF)

To complete this KU, all Topics must be completed: (More than one operating system should be demonstrated).

1. File Systems and File System Forensics
2. Hypervisor Analysis
3. Cryptanalysis
4. Rainbow Tables
5. Known File Filters (KFF)
6. Steganography
7. File Carving
8. Live System Investigations
9. Timeline Analysis
10. Include samples of hands-on activities

Media Forensics (MEF)

To complete this KU, all Topics and sub-Topics must be completed:

1. Drive Acquisition
2. Authentication of Evidence
    1. Verification and Validation
    2. Hashes
3. Metadata
4. Live Static Acquisition
5. Sparse Full Imaging
6. Slack Space
7. Hidden Files/clusters/partitions (must include hands-on activities)

How to Succeed in this Course

Class Meeting Time: Tuesday and Thursday 1:50 pm to 3:10 pm in Discovery Park K120
Office/Student Hours: Monday through Thursday 9 am to 10 am via Microsoft Teams and by Appointment

You may contact me via UNT email, but it must be through the UNT email account, no personal accounts. You may also contact me through Microsoft Teams. I receive a lot of email so give me 24 to 48 business hours for a

response, however if you see me online and available in Microsoft Teams, you can certainly contact me with any quick questions. Office hours offer you an opportunity to ask for clarification or find support with understanding class material. Come and visit me! I encourage you to connect with me for support. Additional office hours, in person and virtually, may be offered as the semester concludes. Your success is our goal.

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the Office of Disability Access website (https://studentaffairs.unt.edu/office-disability-access). You may also contact ODA by phone at (940) 565-4323.

UNT strives to offer you a high-quality education and a supportive environment, so you learn and grow. As a faculty member, I am committed to helping you be successful as a student. To learn more about campus resources and information on how you can be successful at UNT, go to unt.edu/success and explore unt.edu/wellness. To get all your enrollment and student financial-related questions answered, go to scrappysays.unt.edu.

Supporting Your Success and Creating an Inclusive Learning Environment

Every student in this class should have the right to learn and engage within an environment of respect and courtesy from others. We will discuss our classroom's habits of engagement and I also encourage you to review UNT's student code of conduct so that we can all start with the same baseline civility understanding (Code of Student Conduct) (https://policy.unt.edu/policy/07-012).

Required/Recommended Materials

Required Textbook: (title, author, date and edition, publisher, cost, where available) (I recommend that you do not buy/rent used – the JBL subscription card is required with this)

Digital Forensics, Investigation, and Response 4 ed. ISBN:9781284226065 By Chuck Easttom (get the one with lab access card)

US Army Red Team Field Manual (Supplemental Critical Thinking Course)- provided in PDF Format

Recommended/Optional/Supplementary materials and/or readings:

Publication Manual (OFFICIAL) 7th Edition of the American Psychological Association Seventh Edition

Digital Forensics Essentials course (by EC Council).

In class material is provided for additional assistance and deeper dive with permission of EC Council

Other reading content required to complete training will be available in the Canvas shell (at no cost or through readily available weblinks).

Technology requirements for courses with digital materials:

This course has digital components. To fully participate in this class, students will need internet access to reference content on the Canvas Learning Management System and [faculty member to include other required equipment or software such as a webcam, microphone, Adobe Photoshop, etc.]. If circumstances change, you

will be informed of other technical needs to access course content. Information on how to be successful in a digital learning environment can be found at Learn Anywhere (https://online.unt.edu/learn).

Prerequisite (should have a grade of C or better):

- CSCE 3600: Principles of Systems Programming

Course Requirements/Schedule

Here is the schedule as planned. Depending upon the circumstances the schedule is subject to change and the assignments will be updated in Canvas.

Date	Topic	Assignment
8/18, 20	*Introduction to Forensics*	*Discussion Topic Week 1 — Introduce yourself*
8/25, 27	*Overview of Computer Crime*	*Discussion Topic Week 2* *Assignment Lab 1: Applying the Daubert Standard to Forensic Evidence UNT Syllabus Quiz*
9/1, 3	*Forensics Methods and Labs*	*Discussion Topic Week 3 — Forensics Methods* *Lab 2: Recognizing the use of Steganography*
9/8, 10	*Collecting, Seizing*	*Discussion Topic Week 4 — Evidence Collection*
9/15, 17	*Understanding Techniques for Hiding and Scrambling Information*	*Discussion Topic Week 5 — Steganography* *Assignment Lab 3: Recovering Deleted Data and Damaged Files*
9/22, 24	*Recovering Data*	*Discussion Topic Week 6 — Data Recovery* *Assignment Lab 4: Conducting and Incident Response Investigation*
9/29, 10/1	*Incidence Response*	*Discussion Topic Week 7 — Incidence Response* *Midterm Exam*
10/6, 8	*Windows Forensics*	*Discussion Topic Week 8 — (Required) Windows, (Bonus) Halfway Done Feedback* *Assignment Lab 5: Conducting Forensic Investigations on Windows systems*
10/13, 15	*Linux Forensics*	*Discussion Topic Week 9 — Linux* *Assignment Lab 6: Conducting Forensic Investigations on Linux systems*
10/20, 22	*Macintosh Forensics*	*Discussion Topic Week 10 — macOS*
10/27, 29	*Email Forensics*	*Discussion Topic Week 11 — Email Forensics* *Assignment Lab 7: Conducting Forensic Investigations on email and chat logs*
11/3, 5	*Mobile Forensics*	*Discussion Topic Week 12 — Cell phones* *Assignment Lab 8: Conducting Forensics Investigations on Mobile Devices*
11/10, 12	*Network Forensics*	*Discussion Topic Week 13 — Network Forensics* *Assignment Lab 9: Conducting Forensics Investigations on Network Infrastructure*

Date	Topic	Assignment
11/17, 19	*Memory Forensics*	*Discussion Topic Week 14 — Memory Forensics* *Assignment Lab 10: Conducting Forensics Investigations on System Memory*
11/23 to 29	*Thanksgiving*	
12/1, 3	*Trends and Future Directions and Course Review*	*Discussion Topic Week 15 — Trends and Future Directions*
Finals Week	*Final Exam during scheduled Exam period, will be posted in Canvas*	*Final Exam*

You will be notified by Eagle Alert if there is a campus closing that will impact a class and the calendar is subject to change, following the Campus Closures Policy (https://policy.unt.edu/policy/15-006).

Assessing Your Work

The final grade will be assessed using the following grade distribution:

Group	Weight
Attendance	10%
Discussion Questions	25%
Lab Assignments	25%
Exams (Midterm & Final)	40%
Total	**100%**

Grading scale:

A = 90% to 100%
B = 80% to <90%
C = 70% to <80%
D = 60% to <70%
F = <60%

Course Policies

Submission Policy

Students are responsible for submitting the correct assignments in the correct assignment location in Canvas. No assignments will be accepted except through the official assignment submission in Canvas.

AI Course Policy

AI-generated submissions are not permitted and will be treated as plagiarism. In case a student needs to use an AI tool, they must ask for my permission before utilizing AI writing software (such as ChatGPT) for any assignments in this course. Utilizing these tools without obtaining permission could jeopardize your academic integrity.

Make-up Work Policy

Missed exams or assignments due to illness or in the event of an unavoidable absence, make-up work will only be allowed by providing the instructor with a physical copy of a signed doctor's note or any proof in the event of of an unavoidable absence. See the UNT Attendance Policy for more information.

Academic Integrity and Collaboration Policy

Check UNT policy 06.003 that defines the breaches of academic integrity: from Cheating, Plagiarism, Forgery, Fabrication, Facilitating Academic Dishonesty,… etc.

Cheating of any sort will not be tolerated in this course. All submissions must be your own original work. Taking information or code from the internet or other students is considered a breach of academic integrity. Failure to adhere to these strict standards will be cause for disciplinary action that could be as severe as expulsion from the university. If it is determined a student cheated on any assignment in this course they will receive an F for this final course grade and an academic integrity report will be filed with the Office of Academic Integrity. Further, UNT is now maintaining a database recording any acts of academic dishonesty that is available to employers. For more information see the UNT Student Academic Integrity Policy.

Honor Code: "I commit myself to honor, integrity, and responsibility as a student representing the University of North Texas community. I understand and pledge to uphold academic integrity as set forth by UNT Student Academic Integrity Policy, 06.003 (https://policy.unt.edu/policy/06-003). I affirm that the work I submit will always be my own, and the support I provide and receive will always be honorable."

Attendance and Participation

Student attendance will be recorded. Every student who misses a class or a lab is responsible to learn the materials discussed. It is the student's responsibility to obtain the homework assigned on the missed class. I have great respect for students who are balancing the demands of their coursework with the responsibilities of caring for family members. If you run into challenges that require you to miss a class, please contact me or my TA. There may be some flexibility we can offer to support your academic success.

Recitation Attendance

Students must attend their weekly recitation section. If you anticipate being unable to attend your regular recitation section with a valid excuse, you must contact myself and your TA *in advance* of your recitation section before the assignment is closed. Failure to do so may result in a zero for the assignment. The instructor has the final say as to whether an absence is excused.