



Course Name:	Introduction to Digital Forensics
Course Number:	CS 477
Credits:	4
Instructor name:	Bram Lewis
Instructor email:	LewiBram@OregonState.edu
Prerequisite:	C or higher in CS-344 and CS-370.

Course Description

Introduces concepts related to digital forensics, its role and importance, and tools and techniques for collecting and curating digital evidence. The course will also discuss the role of evidence in the justice system and some legal aspects as they pertain to digital forensics. It will introduce tools and techniques for computer forensics.

Communication

Please post all course-related questions on Piazza (found in left navigation panel in Canvas) so the whole class may benefit from our conversation. Piazza is also easily searchable and you may find your question already answered. Not all posts require a reply from the instructor and often it is better for students to hash out an answer to a question.

Please contact me privately for matters of a personal nature. The instructor will reply to most course related questions within 24-48 hours but may take longer over holidays or weekends. If you do not hear from me immediately on an issue that needs a more timely response, please do not hesitate to send a kind reply to your original message so it stays at the top of the inbox. If there is a to-do item that is not critical, the instructor may not respond until the action is complete so as to not miss the action item. Keep in mind, some action items may be completed along with grading, which may be several days.

Office hours and other synchronous discussions will be held on Teams. Otherwise, this course is fully asynchronous. Students will be expected to make full use of the course materials and other engagement opportunities. Students are also encouraged to participate in discussions on Piazza. Not only is there opportunity to have your questions answered, but also to help others, which is one of the best ways to learn.

Ground Rules for Online Communication & Participation:

- Online threaded discussions are public messages, and all writings in this area will be viewable by the entire class or assigned group members. If you prefer that only the instructor reads your communication, send it to the instructor directly by email, making sure to identify yourself and the course.
- Posting of personal contact information is discouraged (e.g. telephone numbers, address, personal website address).

- Online Instructor Response Policy: Instructor check email frequently and will respond to course-related questions within 48 hours if you use a **[CS477]** prepended email tag.
- Observation of "Netiquette": All your online communications must be composed with fairness, honesty and tact. Spelling and grammar are very important in an online course. What you put into an online course reflects on your professionalism. Here are some references discussing
 - writing online: <http://goto.intwg.com/>
 - netiquette: <http://www.albion.com/netiquette/corerules.html>
- Please check Piazza and the course syllabus before you ask general course questions. If you don't see your answer there, then post a new question on the Piazza Q&A threads.

(Adapted from Jean Mandernach, PSY)

Guidelines for a productive and effective online classroom

- The discussion board is your space to interact with your colleagues related to current topics or responses to your colleague's statements.
- Participate actively in the discussions, after completing the readings and carefully considering the issues.
- Pay close attention to what your classmates write in online comments. Ask clarifying questions, when appropriate. These questions are meant to probe and shed new light ... not to minimize or devalue comments.
- Think through and reread your comments before you post them.
- Assume the best about others in the class and expect the best from them.
- Value the diversity of the class. Recognize and value the experiences, abilities, and knowledge each person brings to class.
- It's OK to disagree with ideas, but do not make personal attacks.
- Be open to being challenged or confronted on your ideas or prejudices.

(Adapted from Susan Shaw, WS)

Course Credits

This course combines approximately 120 hours of instruction, online activities, and assignments for 4 credits.

Technical Assistance

If you experience any errors or problems while in your online course, contact 24-7 Canvas Support through the Help link within Canvas. If you experience computer difficulties, need help downloading a browser or plug-in, or need assistance logging into a course, contact the IS Service Desk for assistance. You can call (541) 737-8787 or visit the [IS Service Desk](#) online.

Learning Resources

The instructor will provide students with lecture notes, links to online resources and/or textbooks such as the following...

- Campbell et. Al, *Introduction to Digital Forensics Student Handbook*, University of Illinois

- Michael B. Mukasey, Jeffrey L. Sedgwick, David W. Hagy, *Electronic Crime Scene Investigation: A Guide for First Responders, Second Edition*, U.S. Department of Justice.
- Cichonski et. al, *National Institute of Standards and Technology Special Publication 800-61, Rev. 2, Computer Security Incident Handling Guide*.

Measurable Student Learning Outcomes

At the completion of this course, students will be able to:

1. **Distinguish** relevant legal structure and laws, including evidentiary rules and criminal investigation techniques
2. **Understand** and describe the collection and analysis of forensics evidence on digital systems
3. **Use** legally-sound evidence gathering and curating techniques for digital forensics
4. **Apply** tools and techniques to acquire, curate and authenticate forensics evidence from digital systems
5. **Analyze** forensics evidence and demonstrate a complete investigation of a real-world platform/system containing evidence of a cybercrime/incident

Evaluation of Student Performance

Final grades will be comprised of the following weighted components:

- Homeworks/Quizzes/Participation/Hands-on Lab Assignments (approx. 40%)
- Forensic Analysis Final Project (approx. 30%)
- Exams (approx. 30%)

Letter Grade

Grade	Percent Range
A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-77
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	<60

Course Content

- Digital forensics concepts:

This course is offered through Oregon State University Extended Campus. For more information visit:
<http://ecampus.oregonstate.edu>.

- What is forensics?
- Branches and applications of digital forensics.
- Overview of forensics principles: scientific method, evidence principles, documentation, reporting & testimony.
- Sociological and Legal Aspects of Digital Forensics



- Structure of legal system - Disputes/adversarial, Civil vs. criminal justice systems
 - Rules of evidence, chain of custody, best evidence rule etc.
 - Bill of Rights; requirement of warrant; expectations of privacy; exceptions
 - Privacy laws, cyber crime laws, electronic communication laws
- Computer Forensics
 - What is computer forensics?
 - Forensics Investigative Process
 - Introduction to timeline analysis methodology
- Evidence Preservation and hardware fundamentals
 - Forensic duplication, Drive Imaging
 - Write-blockers and related tools; maintaining integrity of evidence; hashing algorithms
 - SSDs vs. HDDs
 - Live memory capture
- Analysis of File Systems
 - Metadata Files/attributes
 - Recovering deleted files/evidence, file carving, fragmentation
- System Configuration Analysis
 - Keys and Values
 - Tracing user activity
 - Device and application installation
- Log Analysis and Reconstruction
- Application Analysis
 - Application metadata
 - Metadata tampering detection
 - Web browser forensics
 - Email forensics
- Additional related topics, time permitting
 - Fraud Investigations
 - Network Forensics
 - Digital Archives
 - Incident Management and Response - Preparation; Detection and Analysis; Containment, Eradication, and Recovery; Post-Incident Activity

Note: There will be modifications to the course activities. Activities will be updated by approximately 2 weeks prior to the start of the week. Please see the Modules section within the course for the most updated list.

Course Policies

Discussion Participation

Students are expected to participate in all graded discussions. While there is great flexibility in online courses, this is not a self-paced course. For graded discussions, you will need to participate on at least two different days each week, with your first post due no later than Thursday evening, and your second and third posts due by the end of each week by Sunday.

Late Work Policy

All assignments must be submitted before the due date. Late submissions will not be accepted. If you do not submit before the due date, you will receive no credit.

Revision Grace Period

The "revision grace period" policy is for quizzes and assignments. The revision grace period is meant to be flexible and applied to any course activity if it is logically possible and does not conflict with the end of the course. If you are unable to fulfill an assignment, project step, or quiz to your satisfaction before the due date--for any reason--you may notify the instructor (via a Canvas comment and email along with the original on-time submission in Canvas) that you plan to submit a revision. You may then submit a revision within 3 days. Discussion posts and the final are not eligible for late revisions.

If you:

1. submit a partial fulfillment of the requirements before the due date,
2. notify the instructor when you submit your first attempt, and then
3. resubmit a revised version of your work within 3 days,

your grade will reflect your final submission only without incurring penalties. If you do not resubmit within 3 days, your grade will reflect your original (potentially incomplete) submission.

Exceptions may be made at the instructor's discretion for documented emergencies e.g. hospitalization, or extraordinary extenuating circumstances.

Makeup Exams

Makeup exams will be given only for missed exams excused in advance by the instructor. Excused absences will not be given for airline reservations, routine illness (colds, flu, stomach aches), or other common ailments. Excused absences will generally not be given after the absence has occurred, except under very unusual circumstances.

Incompletes

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of your child), if the student has turned in 70% of the points possible (in other words, usually everything but the final paper), and at the discretion of the instructor. If you are having any difficulty that might prevent you completing the coursework, please don't wait until the end of the term; let me know right away.

Statement Regarding Religious Accommodation

Oregon State University is required to provide reasonable accommodations for employee and student sincerely held religious beliefs. It is incumbent on the student making the request to make the faculty member aware of the request as soon as possible prior to the need for the accommodation. See the [Religious Accommodation Process for Students](#).

Guidelines for a Productive and Effective Online Classroom

Students are expected to conduct themselves in the course (e.g., on discussion boards, email) in compliance with the university's regulations regarding civility. Civility is an essential ingredient for academic discourse. All communications for this course should be conducted constructively, civilly, and respectfully. Differences in beliefs, opinions, and approaches are to be expected. In all you say and do for this course, be professional. Please bring any communications you believe to be in violation of this class policy to the attention of your instructor.

Active interaction with peers and your instructor is essential to success in this online course, paying particular attention to the following:

- Unless indicated otherwise, please complete the readings and view other instructional materials for each week before participating in the discussion board.
- Read your posts carefully before submitting them.
- Be respectful of others and their opinions, valuing diversity in backgrounds, abilities, and experiences.
- Challenging the ideas held by others is an integral aspect of critical thinking and the academic process. Please word your responses carefully, and recognize that others are expected to challenge your ideas. A positive atmosphere of healthy debate is encouraged.

Expectations for Student Conduct

Student conduct is governed by the university's policies, as explained in the [Student Conduct Code](#). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

Academic Integrity

The Code of Student Conduct prohibits Academic Misconduct and defines it as:

"Any action that misrepresents a student or group's work, knowledge, or achievement, provides a potential or actual inequitable advantage, or compromises the integrity of the educational process."

To support understanding of what can be included in this definition, the Code further classifies and describes examples of Academic Misconduct, including cheating, plagiarism, assisting and others. See the Code of Student Conduct for details.

You are expected to do your own work and demonstrate academic integrity in every aspect of this course. Familiarize yourself with the standards set forth in the OSU Code of Student Conduct Section 4.2. You must only access sources and resources authorized by the

instructor. You may not show your work to any other current or future students without the instructor's authorization. Violations of these expectations or the Code of Student Conduct will be reported to the Office of Student Conduct and Community Standards. If there is any question about whether an act constitutes academic misconduct, it is your responsibility to seek clarification and approval from the instructor prior to acting.

Academic Integrity DOs and DON'Ts

- You are encouraged to discuss course content with each other, even including general discussion of homework assignments and how to fix specific issues.
- You may post small snippets of non-working assignment code to Piazza or the official course Teams. If you have trouble narrowing the problem down to a small snippet, just describe the problem as well as you can and/or ask your instructor for help.
- You may ask conceptual questions related to assignments on Piazza or the official course Teams.
- You may post code for the exploration exercises on Piazza or the official course Teams.
- You may not post any quiz questions or answers in any form.
- You may not make your code publicly accessible. For example, any git repo you post assignment code on must be private, with the exception of the Portfolio assignment.
- You may share and compare your assignment code or lab results with other students on Piazza or the official course Teams 48 hours after the assignment was due. Keep in mind that there's not just one correct way to write a program - there's almost always a variety of correct approaches. As you compare with others' code, try to notice what seem to be advantages or disadvantages of a particular approach, and don't be afraid to ask questions about why someone made a certain design decision.

It is important that you understand what student actions are defined as academic misconduct at Oregon State University. The OSU Libraries offer a [tutorial on academic misconduct](#), and you can also refer to the [OSU Student Code of Conduct](#) and [the Office of Student Conduct and Community Standard's website](#) for more information. More importantly, if you are unsure if something will violate our academic integrity policy, ask your professors, GTAs, academic advisors, or academic integrity officers.

TurnItIn

Your instructor may ask you to submit one or more of your writings to Turnitin, a plagiarism prevention service. Your assignment content will be checked for potential plagiarism against Internet sources, academic journal articles, and the papers of other OSU students, for common or borrowed content. Turnitin generates a report that highlights any potentially unoriginal text in your paper. The report may be submitted directly to your instructor or your instructor may elect to have you submit initial drafts through Turnitin, and you will receive the report allowing you the opportunity to make adjustments and ensure that all source material has been properly cited. Papers you submit through Turnitin for this or any class will be added to the OSU Turnitin database and may be checked against other OSU

paper submissions. You will retain all rights to your written work. For further information, visit [Academic Integrity for Students: Turnitin – What is it?](#)

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval, please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Accessibility of Course Materials

All materials used in this course are accessible. If you require accommodations please contact [Disability Access Services \(DAS\)](#).

Additionally, Canvas, the learning management system through which this course is offered, provides a [vendor statement](#) certifying how the platform is accessible to students with disabilities.

Tutoring and Writing Assistance

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing suite where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Canvas class by clicking on the Tools button in your course menu.

The Oregon State [Online Writing Suite](#) is also available for students enrolled in Ecampus courses.

Ecampus Reach Out for Success

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about [resources that assist with wellness and academic success](#).

Ecampus students are always encouraged to discuss issues that impact your academic success with the [Ecampus Success Team](#). Email ecampus.success@oregonstate.edu to identify strategies and resources that can support you in your educational goals.

If you feel comfortable sharing how a hardship may impact your performance in this course, please reach out to me as your instructor.

For mental health:

Learn about [counseling and psychological resources for Ecampus students](#). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

For financial hardship:

Any student whose academic performance is impacted due to financial stress or the inability to afford groceries, housing, and other necessities for any reason is urged to contact the Director of Care for support (541-737-8748).

Student Evaluation of Courses

The online Student Evaluation of Teaching system opens to students during the week before finals and closes the Monday following the end of finals. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the online learning experience for future students. Responses are anonymous (unless a student chooses to "sign" their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.