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| <b>Course Name:</b>                  | Introduction to Digital Forensics   |
| <b>Course Number:</b>                | CS 477  |
| <b>Credits:</b>                      | 4   |
| <b>Instructors:</b>                  | Bram Lewis ( <a href="mailto:Bram.Lewis@OregonState.edu">Bram.Lewis@OregonState.edu</a> ) |
| <b>Graduate Teaching Assistants:</b> | N/A   |
| <b>Prerequisites:</b>                | 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 in the **Ed Discussions** forum so that the whole class may benefit from our conversation. Please contact your instructor privately for matters of a personal nature. We will strive to reply to course-related questions within 48 business hours. We will strive to return your assignments and grades for course activities to you within one week of the due date. You can find a detailed communication policy as well as information on **Microsoft Teams** Office Hours on the Course Homepage.

## 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*.

**Note:** Check with the OSU Beaver Store for up-to-date information for the term you enroll ([OSU Beaver Store website](#) or 800-595-0357). If you purchase course materials from other sources, be very careful to obtain the correct ISBN

## 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-    | 90-92.99      |
| B+    | 87-89.99      |
| B     | 83-86.99      |
| B-    | 80-82.99      |
| C+    | 77-79.99      |
| C     | 73-76.99      |
| C-    | 70-72.99      |
| D+    | 67-69.99      |
| D     | 63-66.99      |
| D-    | 60-62.99      |
| F     | 0-59.99       |

## Course Content

- Digital forensics concepts:
  - 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 peer response 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 labs and programming projects. If you are unable to fulfill a lab or programming project requirement to your satisfaction before the due date **for any reason** you may notify the learning assistants and instructors (via a Canvas comment along with an initial **on-time** submission) that you plan to submit a revision. You may then submit a revision within 3 days. Discussion posts and exams are not eligible for revisions.

If you

1. submit a partial fulfillment of the requirements before the due date,
2. notify the learning assistants and instructors when you submit your initial attempt using a comment to the assignment in Canvas, and then
3. resubmit a revised version of your work within 3 days,

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

Exceptions may be made at an instructor or learning assistant's discretion for emergencies or 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), and if the student has turned in 70% of the points possible (in other words, usually everything but the final exam). 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**

(Adapted from Dr. Susan Shaw, Oregon State University)

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 (<https://beav.es/codeofconduct>). 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**

Integrity is a character-driven commitment to honesty, doing what is right, and guiding others to do what is right. Oregon State University Ecampus students and faculty have a responsibility to act with integrity in all of our educational work, and that integrity enables this community of learners to interact in the spirit of trust, honesty, and fairness across the globe.

Academic misconduct, or violations of academic integrity, can fall into seven broad areas, including but not limited to: cheating; plagiarism; falsification; assisting; tampering; multiple submissions of work; and unauthorized recording and use.

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

TutorMe is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Access TutorMe from within your Canvas 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](mailto:ecampus.success@oregonstate.edu) to identify strategies and resources that can support you in your educational goals.

- **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**

During Fall, Winter, and Spring term the online Student Evaluation of Teaching system opens to students the Wednesday of week 8 and closes the Sunday before Finals Week. 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 hybrid 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.