

CS693 Adv Computer Security I - Fall 2017

Course	78806
Section	F01
Credits	3
Prerequisites	CS 372 and CS 321
Instructor	Dr. Orion Lawlor
Phone	907-474-7678
Office	Chapman 201E
Email	lawlor@alaska.edu
Office Hours	MTWRF 3:30 p.m. - 5 p.m.
Meeting Time	TR 11:30 a.m. - 1:00 p.m. Literature review session Thursday from 1:00-1:30pm.
Room	Chapman 206
Course Website	https://www.cs.uaf.edu/courses/cs493-computer-security-i/2017-fall/
Required Texts	None - readings will be provided online

Course Description

Advanced techniques in web application and data storage security. Includes detailed technical literature on encrypted communication and filesystems, hashing, certificates, and modern attacks like cross-site request forgery. Forensic tools include log file and filesystem analysis. As a graduate course, students will be expected to be able to read and write technical literature in the field, and perform complex projects independently.

Student Learning Outcomes

After taking this course, students will be able to:

- explain the state of the art in web application security.
- perform a courtroom-quality forensic examination of a drive image.
- explain and advance the technology underlying the current computer security arms race.

Course Schedule (Highly Tentative!)

For the week starting:

1. Aug 29: Survey of data storage approaches
Literature: [database schema principles](#)

2. Sep 05: Forensic data recovery from deleted files and drive slack space
Literature: [filesystem recovery for incident response](#)
3. Sep 12: Encrypting files, full disk encryption
Literature: [AES \(Rijndael\) paper](#)
4. Sep 19: Filesystem change and rootkit detection with cryptographic hashing
Literature: [rootkit detection and analysis paper](#)
5. Sep 26: Filesystem forensic reconstruction and courtroom-quality testimony
Literature: [Zeitline reconstruction paper](#)
6. Oct 03: Web application architecture: clients, servers, databases
Literature: [Node.js design paper](#)
7. Oct 10: Web data sanitization: SQL injection attack
Literature: [SQL injection attacks & countermeasures](#)
8. Oct 17: Data sanitization summary
 - Literature: [compiler techniques for sanitization](#)
9. Oct 24: Midterm Exam
10. Oct 31: Website man-in-the-middle attack: configuring HTTPS
Literature: [Public Key Infrastructure \(PKI\) risks](#)
11. Nov 07: Cryptographic signatures and secret key encryption
Literature: [measuring the Debian OpenSSL bug response](#)
12. Nov 14: Web authentication and cross-site request forgery (XSRF)
Literature: [handling user authentication tokens](#)
13. Nov 21: (No class Thursday due to Thanksgiving)
14. Nov 28: Web logfile analysis and forensics
Literature: [distributed attack aggregation](#)
15. Dec 5: Project 2 presentations
16. 10:15 a.m.-12:15 p.m., Tuesday, December 12: Final Exam

Grading Policies

Weight	Description
30%	Exams: a midterm and final exam
50%	Project: one semester-length independent project, including: ● Literature review ● Problem selection and definition ● Literature review presentation ● Review draft writeup ● Experimental analysis ● Final presentation ● Final draft writeup
15%	Homeworks: technical paper summaries, forensic analysis, and machine problems, to be assigned through the semester

5%	Attendance and class participation, graded at random intervals throughout the semester
----	--

Grades will be assigned based on the following percentage intervals:

A+	*	A	[93%, 100%)	A-	[90%, 93%)
B+	[87%, 90%)	B	[83%, 87%)	B-	[80%, 83%)
C+	[77%, 80%)	C	[73%, 77%)	C-	[70%, 73%)
D+	[67%, 70%)	D	[63%, 67%)	D-	[60%, 63%)
F	[0%, 60%)				

* A+ indicates truly exceptional work, above and beyond the course requirements.

Late Work Policy

Late work will not be graded, unless it is due to circumstances beyond your control, or if you turn it in before I begin grading. I may begin grading at any time after the due date, even 12:01am the next day (grading is an effective treatment for insomnia!). You are encouraged to inquire if I have begun grading yet, since this acts as a reminder for me to do so.

Policies

Students are expected to be at every class meeting on time, and are responsible for all class content, whether present or not. If absence from class is necessary, in-class work (other than quizzes) and homework may be made up only if the instructor is notified as soon as possible; in particular, absences due to scheduled events must be arranged ahead of time. Academic dishonesty will not be tolerated, and will be dealt with according to UAF procedures. Students in this class must pay the CS lab fee. Payment allows access to the Chapman 103 lab.

UAF academic policies <http://www.uaf.edu/catalog/current/academics>

CS Department policies <http://www.cs.uaf.edu/departamental-policies/>

Inclusion Statement

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: www.alaska.edu/nondiscrimination

The University of Alaska Board of Regents have clearly stated in BOR policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment, including sexual

harassment/misconduct/assault, you are encouraged to report that behavior. If you disclose sexual harassment or sexual violence to faculty members or university employees, they must notify the UAF Title IX coordinator about the basic facts of the incident. Your choices for disclosure include:

1. You may confidentially disclose and access confidential counseling by contacting the UAF Health and Counseling Center at 474-7043.
2. You can get support and file a Title IX report by contacting the UAF Title IX coordinator at 474-7599.
3. You may file a criminal complaint by contacting the UAF Police Department at 474-7721.

From Disability Services: UAF is obligated to provide accommodation only to the known limitations of an otherwise qualified student who has a disability. Please identify yourself to UAF Disability Services by applying for accommodations. To be considered for UAF Disability Services accommodations, individuals must be enrolled for at least one credit as a UAF student. For more information contact Disability Services at uaf-disabilityservices@alaska.edu, 474-5655 or by TTY at 474-1827.