

General Information

Section: 901, Credit hours: 3, Class meetings: MW 2-3:15pm in ISA 3050

Instructor: Jay Ligatti (ligatti@cse.usf.edu), Office location: ENB 333

Office hours: MW 3:30-5pm, and other times by appointment

Course description: Introduction to research in foundations of software security. Basic static and dynamic enforcement of security policies. Roles and meanings of policies, properties, mechanisms, and enforcement. Language-based security and tools for specifying security. **Student outcomes:** Students having successfully completed this course will obtain a breadth of knowledge in the foundations of software security by reading a selection of research papers in the area and will obtain a depth of knowledge by performing independent research in the area.

Course Materials

All readings will be from papers available online or handed out in class. Please check the course website (<http://www.cse.usf.edu/~ligatti/foss-19>) regularly for announcements, links to reading material, and an up-to-date schedule. Grades will be posted on Canvas (<http://my.usf.edu/>). I may also send announcements via Canvas, so please ensure that your current email address is stored there.

Tentative Schedule

<u>Week</u>	<u>Dates</u>	<u>Topics</u>
1	01/07, 01/09	Introduction and definitions; enforceability theory
2	01/14, 01/16	Enforceability theory
3	01/23	Enforceability theory
4	01/28, 01/30	Enforceability theory
5	02/04, 02/06	Policy-specification languages
6	02/11, 02/13	Policy-specification languages; Stack inspection
7	02/18, 02/20	Vulnerability trends; Buffer overflows
8	02/25, 02/27	Code-injection attacks
9	03/04, 03/06	Web security; XSS
10	03/18, 03/20	Student presentations (project proposals)
11	03/25, 03/27	CFI
12	04/01, 04/03	Noninterference and information flow
13	04/08, 04/10	Hardware security; DRM
14	04/15, 04/17	Trustworthiness; backdoors
15	04/22, 04/24	Student presentations (final project presentations)

Final-grade breakdown:

40%	Quiz average
10%	Peer-proposal reviews
10%	Research project: Proposal presentation
7%	Research project: Final presentation
33%	Research project: Final research paper, due in class 4/24

Quizzes:

In every class meeting (except during student presentations), we'll have a quiz.

Quizzes will typically cover the following sorts of topics about the readings:

- What's the problem being addressed? (Motivation)
- Why don't existing approaches address that problem? (Related Work)
- How does the new solution work and go beyond prior work? (Contributions)
- What evidence exists, that the proposed solution works? (Experiments or Proofs)
- Where was the paper published? What quality of review exists at that venue?

Quizzes will:

- be closed notes, papers, books, phones, laptops, neighbors, etc.
- occur at the beginning of class.
- cover any reading for the current class meeting, as well any material discussed during previous class meetings.
- require you to write responses on paper to oral prompts. Please bring paper and a pen/pencil to every class meeting, for the quiz.
- be graded on accuracy, thoroughness, and readability. Write in complete, easy-to-read, well-organized, English sentences. Avoid irrelevant details. Because quizzes are intended, in part, to evaluate and improve your skills at writing prose, avoid bulleted lists in your responses.

Your 2 lowest quiz scores will be dropped. This policy allows you to miss class for a week due to an emergency or illness, without it affecting your grade. I'll automatically drop your 2 lowest quiz scores, so please don't email me about absences.

Research project:

The centerpiece of this course is a research project. Students can work on the project alone or in small groups of 2 or 3 students. The project involves performing and presenting original research in the broad area of software security.

The research project is broken up into:

- A presentation for the class, given immediately after Spring Break, describing the problem you plan to work on, existing approaches to the problem, and techniques you're using to try to address the problem. The presentation will be graded based on peer and instructor evaluations.
- *Optional*: A rough draft of a research paper, as long as it's given to me in class by 4/15. I'll comment on all the issues I see in a rough draft, so you'll know what to focus on improving.
- An in-class presentation of your research findings, at the end of the semester, graded based on instructor evaluation.
- A final research paper, due in the final class meeting, graded based on readability, novelty, and significance.

Students will also be asked to review the project proposals of their classmates by emailing me, for every proposal presentation besides their own, exactly one paragraph describing the primary strengths and/or weaknesses of that proposal. Valid points made in peer reviews will help determine presentation grades.

Send peer reviews as plain text in the body of an email (not as an attachment). Reviews of proposal presentations are due at 5pm on 3/21.

Late submission:

The only graded items that can be turned in late for credit are peer reviews and final research papers. These items can be emailed up to two days late with a 15% penalty.

Attendance:

I do not take attendance directly, but quizzes are an indirect method of requiring attendance. Students who will miss class for religious reasons must notify me of the date(s) in writing by the end of the first week of classes. Please do not sell notes from, or record, class meetings without my permission.

Grading system:

The scale for final letter grades is as follows, using standard notation for ranges:

	A (∞ , 93.3]	A- (93.3,90]
B+ (90,86.7]	B (86.7,83.3]	B- (83.3,80]
C+ (80,76.7]	C (76.7,73.3]	C- (73.3,70]
D+ (70,66.7]	D (66.7,63.3]	D- (63.3,60]
F (60,- ∞)		

An A+ may be awarded for exceptionally outstanding work.

Additional, optional reading:

Some students may wish to supplement the papers being read this semester with more introductory readings from a textbook. If you're such a student, I'd recommend "Information Security: Principles and Practice" by Mark Stamp. Readings from this textbook are optional; I expect you'll learn what you need for this course just by (1) reading the assigned papers, (2) using web searches to figure out unfamiliar topics, (3) participating in our class discussions, and (4) doing your research project.

Academic honesty:

Academic honesty is crucial in research; cite sources and do not plagiarize. You'll receive an FF grade if you're caught cheating or plagiarizing in any way for this course.

The following page contains additional information required to appear on USF syllabi. Every part of this syllabus is subject to adjustment as the semester progresses. Please contact me as soon as possible if you're dissatisfied with the course policies, discussions, readings, grading, etc.; I'll be happy to accommodate reasonable requests for modifications.

Academic Integrity Academic integrity is the foundation of the University of South Florida System's commitment to the academic honesty and personal integrity of its university community. Academic integrity is grounded in certain fundamental values, which include honesty, respect, and fairness. Broadly defined, academic honesty is the completion of all academic endeavors and claims of scholarly knowledge as representative of one's own efforts. The final decision on an academic integrity violation and related academic sanction at any USF System institution shall affect and be applied to the academic status of the student throughout the USF System, unless otherwise determined by the independently accredited institution. The process for faculty reporting of academic misconduct, as well as the student's options for appeal, are outlined in detail in [USF System Regulation 3.027](#).

Disruption to Academic Progress Disruptive students in the academic setting hinder the educational process. Disruption of the academic process is defined as the act, words, or general conduct of a student in a classroom or other academic environment which in the reasonable estimation of the instructor: (a) directs attention away from the academic matters at hand, such as noisy distractions, persistent, disrespectful or abusive interruption of lecture, exam, academic discussion, or general University operations, or (b) presents a danger to the health, safety, or well-being of self or other persons.

Academic Grievance Procedure The purpose of these procedures is to provide all undergraduate and graduate students taking courses within the University of South Florida System an opportunity for objective review of facts and events pertinent to the cause of the academic grievance. An "academic grievance" is a claim that a specific academic decision or action that affects that student's academic record or status has violated published policies and procedures, or has been applied to the grievant in a manner different from that used for other students.

Disability Access Students with disabilities are responsible for registering with Students with Disabilities Services (SDS) (SVC 1133) in order to receive academic accommodations. SDS encourages students to notify instructors of accommodation needs at least 5 business days prior to needing the accommodation. A letter from SDS must accompany this request.

Sexual Misconduct / Sexual Harassment USF is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence ([USF System Policy 0-004](#)). The USF Center for Victim is a confidential resource where you can talk about incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. This confidential resource can help you without having to report your situation to either the [Office of Student Rights and Responsibilities](#) (OSSR) or the [Office of Diversity, Inclusion, and Equal Opportunity](#) (DIEO), unless you request that they make a report. Please be aware that in compliance with Title IX and under the USF System Policy, educators must report incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to OSSR or DIEO for investigation. Contact the [USF Center for Victim Advocacy and Violence Prevention](#): (813) 974-5757.

Religious Observances All students have a right to expect that the University will reasonably accommodate their religious observances, practices and beliefs ([USF System Policy 10-045](#)). The USF System, through its faculty, will make every attempt to schedule required classes and examinations in view of customarily observed religious holidays of those religious groups or communities comprising the USF System's constituency. Students are expected to attend classes and take examinations as determined by the USF System. No student shall be compelled to attend class or sit for an examination at a day or time prohibited by his or her religious belief. However, students should review the course requirements and meeting days and times to avoid foreseeable conflicts, as excessive absences in a given term may prevent a student from completing the academic requirements of a specific course. Students are expected to notify their instructors at the beginning of each academic term if they intend to be absent for a class or announced examination, in accordance with this Policy.

Statement of Academic Continuity In the event of an emergency, it may be necessary for USF to suspend normal operations. During this time, USF may opt to continue delivery of instruction through methods that include, but are not limited to: Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor the Learning Management System for each class for course-specific communication, and the main USF, College, and Department websites, emails, and MoBull messages for important general information ([USF System Policy 6-010](#)). For additional guidance on emergency protective actions and hazards that affect the University, please visit www.usf.edu/em