Secure Coding (CNT 4419)

CRN 14910, Section 001, 3 Credit Hours, 140-student Enrollment Cap
Course Prerequisite: Data Structures (COP 4530)
Bellini College of Artificial Intelligence, Cybersecurity, and Computing

COURSE SYLLABUS

NB: Everything on this syllabus is subject to change as the semester progresses.

Instructor Name:	Jay Ligatti (ligatti@usf.edu)	Semester/Term:	Spring 2026
Instructor Office Hours:	MW 5-6:30pm (in ENB 333) and other times by appointment	Class Meeting Times:	MW 3:30-4:45pm
Course webpage:	www.cse.usf.edu/~ligatti/sc/26/	Class Location:	CWY 107
Teaching Assistants*:	Gabriel Laverghetta (glaverghetta@usf.edu) Yuwen Cui (ycui@usf.edu)	TA Office Hours*:	TTh 12-1:30pm (Teams) M 10-11:30am (NEC 118)

*Gabriel's office hours are TTh 12-1:30pm on Teams at this link: Gabriel's Office Hours
If for any reason this Teams link does not work, please email Gabriel for an up-to-date link.
Gabriel is also available for in-person meetings by appointment—please email him to make an appointment.
Gabriel is responsible for (1) answering student questions about course *material, tests, quizzes, and the exam*, and (2) grading tests, quizzes, and the exam.

*Yuwen's office hours are M 10-11:30am in NEC 118 and on Teams (email Yuwen for a Teams link if desired).
Yuwen is responsible for (1) answering student questions about course *assignments*, (2) grading assignments and quizzes, and (3) helping create the assignments.

Course Information and Policies

I. University Course Description

Principles and practices for secure computing and writing secure software, including software for performing information management and networking and communications.

II. Course Purpose

Software developers should be familiar with and understand the basic principles and practices for computing securely and writing secure software. This course covers these topics, including in the context of software for performing information management and networking and communications.

III. Course Objectives

Students having successfully completed this course will understand the basic principles and practices of secure computing and writing secure software, including: security threats, secure software design, authentication, authorization, access control, buffer-overflow attacks, type safety, layered networking architectures, basic network protocols, firewalls, intrusion-detection systems, web applications, databases and information management, SQL queries, SQL injection attacks and defenses, XSS, symmetric cryptography, asymmetric cryptography, and password management.

IV. Student Learning Outcomes

Students will demonstrate the ability to:

1. explain the basic principles and practices of secure computing and writing secure software;
2. analyze, evaluate, and explain security vulnerabilities (including buffer overflows, SQL injections, and XSS) in software designs and implementations;
3. synthesize alternative designs and implementations that incorporate mitigations for observed vulnerabilities; and
4. apply knowledge of information management and computer networking and communications while performing software-security assessments and designing and implementing secure code.

V. Required Textbook

- Foundations of Security. Neil Daswani, Christoph Kern, and Anita Kesavan. Apress, 2007 (1st ed). ISBN-10: 1590597842; ISBN-13: 978-1590597842. This book is accessible online from machines on the USF network: https://link.springer.com/book/10.1007/978-1-4302-0377-3

VI. Supplementary Required Readings

- Additional required online readings, if any, will be linked from the course webpage.

VII. Basis for Final Grade

There will be **3 tests** (on 2/11, 3/11, and 4/15), **1 final exam** (on 5/6), **4 assignments**, and an undetermined number of **unscheduled ("pop") quizzes**.

All tests, quizzes, and final exam are cumulative; earlier material may appear on any test, quiz, or exam. However, a quiz given in one class meeting will only cover material from previous class meetings, not material from the same class meeting as the quiz itself.

Each test is scheduled for a full 75-minute class period. The final exam is scheduled for 2 hours, as usual. Each quiz will be expected to take only 2 minutes and will require answering no more than 2 short questions, which the instructor will state verbally. Students will be given paper on which to answer the spoken quiz question(s). **Bring a writing instrument to every class, to complete any quizzes given during that class**.

Quizzes may be given at any point during a scheduled class meeting, including the beginning, middle, or end of class. Up to 2 quizzes may be given on the same day. When 2 quizzes are given on the same day, each will be considered a half quiz and graded together to determine a single quiz score.

Your 1 lowest test score and 2 lowest quiz scores will be dropped when calculating your final score.

Your final score for the course will be calculated as a weighted average, based on the following weights:

40% for the average of your test scores (all but the lowest 1, which is dropped)
20% for the average of your quiz scores (all but the lowest 2, which are dropped)
10% for your assignment average
30% for your final exam score

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], and F (60,-∞). A+ grades may be awarded for exceptionally outstanding work.

Attendance: I do not directly take attendance in class, but absences may affect your grade by causing you to miss quizzes, tests, or the exam. There are no make-ups or extensions given for any of these in-class assessments. Absences may also affect your final grade by causing you to miss material not covered in the textbook, schedule updates, etc.

VIII. Grade Dissemination

Grades will be posted on Canvas.

IX. Course Policies: Grades

Late Work Policy: No credit will be given for work turned in late.
There are no make-ups or extensions for tests, quizzes, assignments, or final exam. Do not email course staff requesting a make-up or extension.

Your 1 lowest (non-exam) test score and 2 lowest quiz scores are automatically dropped, allowing you to miss up to 3 regular class meetings without penalty. If you must miss enough class meetings, even with valid excuses, to the point that it significantly affects your course grade, you should consider dropping or withdrawing from the course (e.g., medical withdrawal or late withdrawal via an ARC petition).

It is intended for you to use these 3 low-score drops for valid, excused university absences—for example, military service, documented illness, or observance of a religious holiday. However, the scores will be dropped regardless of cause.

Because your lowest test and quiz scores will be dropped automatically, do not email or otherwise notify course staff as to why, or even that, you're missing any class or test. Again, I already assume, by default, that any missed class meetings or tests are due to valid, excused absences.

Absence from the Final Exam: If you have a documented, valid, and verifiable excused absence from the final exam, please email the instructor no later than exam time with the proper documentation. In this case, the average of your 3 test scores (including your lowest test score) will substitute for your final-exam score.

Grade Disputes: Students have 5 days after any grade is posted to discuss or dispute it with course staff. Begin a grade dispute by following the email instructions in Section XI below.

Essay Policy: The tests, assignments, and final exam may include one or more short-answer or essay questions. Respond in complete sentences. Avoid extraneous details in your responses. Also avoid using bulleted/enumerated lists in your responses. Responses will be graded based on readability, correctness, and thoroughness. If a problem specifies a length for the essay or short-answer response (e.g., 2-5 sentences or 1 paragraph), then a full-credit response may not exceed that length.

Leaving the Classroom During a Test/Exam: Leaving the classroom indicates that you're finished taking a test/exam, so be sure to use the restroom before beginning a test/exam.

(Non-)Group Work Policy: Everything you turn in for this course—assignments, tests, quizzes, and final exam—must be your own, individual work. ***All quizzes, tests, and final exam in this course are closed books, notes, phones, computers, AI, smart glasses, smart watches, friends, classmates, etc.*** You must complete the quizzes, tests, and final exam using only your own knowledge and skills, and a writing instrument.

During any in-class assessment (quiz, test, or final exam), do not talk to another student, and do not look at another student's answer(s).

Final Examinations Scheduling: All final exams are to be scheduled in accordance with the University's final examination policy.

X. For Students with Accessibility Memoranda

Please email the instructor to arrange accommodations. Do not schedule any tests, quizzes, or the final exam with Student Accessibility Services. This course has its own separate, reduced-distraction site (room ENB 328) for taking tests and the final exam. A Teaching Assistant will proctor tests and the final exam in this separate site, at the same times that the tests and final exam are being proctored in the main site (i.e., room CWY 107).

XI. Course Policies: Technology and Media

Email: For any questions you'd like answered outside of class, **first email the appropriate teaching assistant** (as outlined on Page 1). If you have done so but are not satisfied with the response, email the instructor and include your original message and the TA's response. Please allow at least 48 hours for a response to any electronic communication.

Canvas: We will use Canvas to post grades and send any urgent announcements. The course schedule and assigned readings are posted on the course webpage (www.cse.usf.edu/~ligatti/sc/26).

XII. Course Policies: Student Expectations

Office hours: All students are welcome to visit during office hours. No appointment is needed. However, office hours are not "study hall"; please arrive with specific questions already prepared.

Old Problems: Problems from some previous CNT 4419 quizzes, tests, and exams are posted online. Although the TAs and I may provide hints on how to solve old problems during our office hours, due to heavy volumes of questions, we will not respond to emailed questions about old problems, nor will we typically provide complete solutions. Because topics and problems change each semester, I recommend focusing your study time on your notes from this semester's class meetings.

Other sections of CNT 4419: Another section of CNT 4419 is running concurrently at USF. Attending or doing work for one section does not substitute for another section. Notes from one section do not substitute for notes from another section.

Expected workload: Per USF Policy 10-065, you should expect to spend, on average, approximately 6 hours per week outside of class on this course, in order to make satisfactory progress toward the intended learning outcomes. For example, you might spend about 1 hour per day, 6 days per week, studying and/or working on assignments in a focused, distraction-free environment.

Academic honesty: Everything you turn in for this course must be your own work. Students caught violating academic integrity, for example by using notes, a phone, a computer, or AI, during a quiz, test, or exam, or copying another's student's solution, will receive an FF grade for the course.

Do not post your assignment solutions on any medium that could be accessed by other current or future Secure Coding students (e.g., in a public GitHub repository), as doing so may make you an accessory to another student's plagiarism.

Suggestions for Success: Attend class, take notes, study notes, do the assignments, and do not cheat.

XIII. USF Core Syllabus Policies

Additional USF policies (e.g., regarding academic integrity) may be accessed at: https://www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx

XIV. *Tentative* Schedule—subject to adjustment as the semester progresses—see the course webpage

Week	Topics
1	Introduction; Definitions (policy, mechanism, enforcement, property)
2	Definitions (safety, liveness, and CIA properties)
3	Unenforceability
4	Threats
5	Tradeoffs; Secure design; Access control; Authentication; Authorization
6	Memory segmentation; Buffer overflows
7	StackGuard; ASLR; CFI; Type safety
8	Format string attacks; Integer overflow attacks
9	Networking and communications; TCP/IP and OSI layered architectures; Protocols; DoS
10	Firewalls; IDSs; Web applications; Client-state manipulation
11	Databases; Information management; SQL queries
12	SQL injection attacks
13	Code injections; XSS
14	XSS; Symmetric cryptography
15	Asymmetric cryptography; Diffie-Hellman; RSA; Signatures; MACs; Password management
Final	**Exam** (Wednesday, May 6, at 12:30-2:30pm)

This schedule is subject to adjustment as the semester progresses.