CS 166-03: Information Security Syllabus

San José State University, Fall 2021

Instructor Information

Instructor	Email	Zoom Office Hours
Yan Chen	yan.chen01@sjsu.edu	TR 15:30 – 16:30 or By Appointment

General Information

MW 14:15 – 15:30 @ https://sjsu.zoom.us/j/83606311340

Catalog Description

Fundamental security topics including cryptography, authentication, access control, network security, security protocols, and software security. Networking basics are covered. Additional security topics selected from multilevel security, biometrics, blockchain, machine learning, information warfare, e-commerce, intrusion detection, system evaluation and assurance.

Prerequisite(s)

Prerequisite: CS 146 (with a grade of "C-" or better); Computer Science, Applied and Computational Math, Forensic Science: Digital Evidence, or Software Engineering Majors only. Permission codes will be provided to the requesters who fulfill the prerequisites based on the priorities stated in University Policy F17-4 (https://www.sjsu.edu/senate/docs/F17-4.pdf).

Course Format

Online Synchronous Mode: live lectures will be conducted at the set times/days via Zoom. Also, those lecture sessions will be recorded and posted on Canvas (https://sjsu.instructure.com/courses/1430534, which is also for all other class activities). Office hours will also be held via Zoom (https://sjsu.zoom.us/j/81038999613).

Course Learning Outcomes (CLO)

After completing this course, you should be knowledgeable of the major technical security challenges in each ofthe following four areas: cryptography, access control, protocols, and software.

Course Materials

There is no required text for this course other than all the materials (lecture notes, homework, etc.) on Canvas. You are responsible for regularly checking the Canvas course page for any updates, including its messaging system.

Further Readings

- Mark Stamp, "Information Security: Principles and Practice," 2nd edition (3rd edition will be released in October)
- Michael Sikorski and Andrew Honig, "Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software." An excellent book for information on reverse engineering (whether for malware analysis or other purposes). Includes many hands-on exercises.
- Software Reverse Engineering (http://reversingproject.info/). This website, which was created by a former masters student, includes lots of good information and detailed exercises with solutions.
- The references at the end of each lecture note.

Course Requirements and Assignments

There will be 4 assignments (optional), 4 topic quizzes (optional) and a final (mandatory).

Assignments

Assignments will be posted on Canvas as untimed quizzes, locked by passwords that are ONLY given in the lectures. May include programming questions (you can pick any programming language). Start early so you have time to ask questions if you need helps. They are optional, but points earned in those assignments will be extra points adding to the final score. See "Grading Information" for more details.

Quizzes

There will be 4 quizzes, each quiz will be focus on one topic (not cumulative). They will be posted on Canvas as timed quizzes. The Zoom meeting on the quiz day is also optional, but you need to finish the exam during the required time frame (see tentative schedule on page 5). Exceptions may ONLY be given in cases of a verifiable emergency or for those who live in a different time zone where the exam time would be in the midnight or early morning. You can view the quizzes as practices for the final.

Although assignments and quizzes are optional, they are highly recommended to practice what you learned in class and to enhance your score. University Policy S16-9 (http://www.sjsu.edu/senate/docs/S16-9.pdf) states that:

> *"Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practice. Other course structures will have equivalent workload expectations as described in the syllabus."*

Final Examination

The final will be in the same format as the quizzes but is cumulative. The date and time are fixed: Thursday, Dec. 9, 12:15 - 14:30 Pacific Time. Exceptions may ONLY be given in cases of a verifiable emergency or for those who live in a different time zone where the exam time would be in the midnight or early morning.

It can be substituted/averaged with the average of the quiz scores. More details will be given in class.

Final Exam is mandatory as University policy S17-1 (http://www.sjsu.edu/senate/docs/S17-1.pdf) states:

> *"Faculty members are required to have a culminating activity for their courses, which can include a final examination, a final research paper or project, a final creative work or performance, a final portfolio of work, or other appropriate assignment."*

Grading Information

There will be 130 points available, including extra credits from optional exercises/activities, as shown in the following table. More details will be given in class.

	Points	Details
Final Exam	100.00	Can be substituted with average quiz score
(Optional) Quizzes	12.00	4 quizzes, 3 pts each if grade over 50% (all-or-nothing)
(Optional) Assignments	12.00	4 assignments total, 3 pts each
(Optional) Others	6.00	Other class activities, such as discussions, etc.
Total	**130.00**	Mandatory (100) + Optional (30)

Grading scale

Grade	Points	Grade	Points	Grade	Points
A	Above 93.00	**B minus**	80.00 to 82.99	**D plus**	66.00 to 69.99
A minus	90.00 to 92.99	**C plus**	76.00 to 79.99	**D**	63.00 to 65.99
B plus	86.00 to 89.99	**C**	73.00 to 75.99	**D minus**	60.00 to 62.99
B	83.00 to 85,99	**C minus**	70.00 to 72.09	**F**	Below 59.99

- A+ will be given for those who receive over 100 points AND have participated in at least 2 other class activities. If more than 1% of students meet these criteria, the top 1% of students will be given an A+.
- Grade near the borderlines will be rounded up depending upon your level and quality of class participation (in-class and in the Discussions on Canvas).
- The grade might be curved ONLY if the final grades of the class at the end of the semester are not normal.

Class Protocol

- Do NOT share any course material publicly (on Canvas, GitHub, etc.) without permission, including but not limited to lecture notes, lecture videos, passwords, homework/exam solutions, and class meeting links.
- No late homework questions (within 24 hours before due, excluding follow-ups) via email.
- You must be dressed for zoom sessions. You may wear pajamas and sweats if you want but wear a shirt.
- Instances of academic dishonesty will not be tolerated. Your own commitment to learning, as evidenced by your enrollment at San José State University and the University's Academic Integrity Policy (https://www.sjsu.edu/senate/docs/F15-7.pdf), require you to be honest in all your academic course work. Cheating or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a reduction in final course grade (first incident of cheating will result in one letter grade off; second incident will result in a F for the class) and administrative sanctions by the University.

Important Dates

Date	Description
Aug. 23, Monday	First Day of instruction (for this class)
Aug. 31, Tuesday	Last day to drop without a W grade
Sep. 8, Wednesday	Last day to add classes via MySJSU
Sep. 8, Wednesday	Last day to submit credit/no-credit option request
Nov. 7, Sunday	Daylight saving time ends (at 2:00 AM Pacific Time)
Nov. 12, Friday	Semester withdrawal deadline
Dec. 6, Monday	Last day of instruction (for this class)
Dec. 7, Tuesday	All class activities except for the final due (for this class)
Dec. 9, Thursday	Final examination (for this class) 12:15 - 14:30 Pacific Time
Dec. 18, Saturday	Grades viewable on MySJSU

Visit https://www.sjsu.edu/classes/calendar/2021-2022.php for the Academic Calendar.

University Policies

Per University Policy S16-9 available at http://www.sjsu.edu/senate/docs/S16-9.pdf, relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information web page available at http://www.sjsu.edu/gup/syllabusinfo. Viewing these policies and resources is highly recommended.

Course Schedule

This is a tentative schedule and is subject to change (except for the final exam) but with fair notice.

Lesson	Date	Topics
0	Mon., Aug. 23	Introduction to the Course
1	Wed., Aug. 25	Crypto - Basic Crypto Algorithms
2	Mon., Aug. 30	Crypto - Symmetric Key Crypto (part 1)
3	Wed., Sep. 1	Crypto - Symmetric Key Crypto (part 2)
/	Mon., Sep. 6	Labor Day - No Class
4	Wed., Sep. 8	Crypto - Public Key Crypto (part 1)
5	Mon., Sep. 13	Crypto - Public Key Crypto (part 2)
6	Wed., Sep. 15	Crypto - Hash Functions and Other Topics (part 1)
7	Mon., Sep. 20	Crypto - Hash Functions and Other Topics (part 2)
8	**Wed., Sep. 22**	**Crypto Review & Quiz**
9	Mon., Sep. 27	Access Control - Authentication (part 1)
10	Wed., Sep. 29	Access Control - Authentication (part 2)
11	Mon., Oct. 4	Access Control - Authorization (part 1)
12	Wed., Oct. 6	Access Control - Authorization (part 2)
13	**Mon., Oct. 11**	**Access Control Review & Quiz**
14	Wed., Oct. 13	Protocols - Simple Authentication Protocols (part 1)
15	Mon., Oct. 18	Protocols - Simple Authentication Protocols (part 2)
16	Wed., Oct. 20	Protocols - Simple Authentication Protocols (part 3)
17	Mon., Oct. 25	Protocols - Real World Security Protocols (part 1)
18	Wed., Oct. 27	Protocols - Real World Security Protocols (part 2)
19	**Mon., Nov. 1**	**Protocol Review & Quiz**
20	Wed., Nov. 3	Software Security - Software Flaws and Malware (part 1)
21	Mon., Nov. 8	Software Security - Software Flaws and Malware (part 2)
22	Wed., Nov. 10	Software Security - Software Flaws and Malware (part 3)
23	Mon., Nov. 15	Software Security - Insecurity in Software (part 1)
24	Wed., Nov. 17	Software Security - Insecurity in Software (part 2)
25	**Mon., Nov. 22**	**Software Security Review & Quiz**
/	Wed., Nov. 24	Thanksgiving Holiday - No Class
26	Mon., Nov. 29	Other Security Topics (part 1)
27	Wed., Dec. 1	Other Security Topics (part 2)
28	Mon., Dec. 6	Final Review
Final	**Thur., Dec. 9**	**12:15 - 14:30 Pacific Time**