

# Syllabus

CYBR 434/534 Network Security, Fall (2025)

**Class:** Mon - Wed 11-11:50. **Lab:** Wed 1-2:50

## Description

This course explores practical topics in network security. Topics include policy and mechanism; malicious code; intrusion detection, prevention, response; cryptographic and protocols for privacy and integrity. This course emphasizes the trade-offs among risks of misuse, cost of prevention and social issues. Concepts are implemented in programming assignments and comprehensive projects.

**NOTE:** You must be enrolled in *CSCD 434L/534L* the co-requisite lab course.

### What it really means

Network security is eclectic and is composed of the amalgamation of many security topics. We'll cover many such topics, their interactions, and how they pertain to network security.

We'll cover fundamental concepts in networking security . Including a technical overview of common attacks (MITM, DoS, remote buffer overflows, etc.) and scans (network mapping, idle scans, etc.). Programming projects are required.

## Course outcomes

Upon completion of this course students will be able to:

- Scan a network.
- Detect malicious network activity via pcap analysis.
- Understand `iptables` and create rules to defend against common scenarios.
- Apply critical thinking to network attacks from an adversarial prospective.
- Create bash scripts for automation of testing and administrative tasks.

## Course Textbook

**No official textbook.**

Assigned readings will be made available via canvas.

*Hacking The art of exploitation* by Jon Erickson, is a good book though.

So is Matt Bishop's *Introduction to Computer Security*.

For encryption, see Bruce Schneier's books *Cryptography Engineering* and *Applied cryptography*.

## Instructor information

**Instructor:** Antonio Espinoza (he/him)

**Office:** CAT 338

**Office hours:** M,T 12:00-1:30, W 12:00-1:00 and by appointment.

Email: [aespinoza17@ewu.edu](mailto:aespinoza17@ewu.edu)

## 534/G<sub>raduate</sub> students

A portion of your grade will be from a lecture you will give. Each graduate student taking 534 will need to pick a topic and give a full class lecture on it including at least 1 demonstration (e.g., a live demo of an attack). This will contribute to your lab and homework grade.

You must pick a topic by the end of week 2 and schedule your presentation. It is up to you to see me in office hours or schedule an appointment.

## Tentative topic schedule

| Week | Topics/Labs   |
|------|---|
| 1    | Introduction<br>Lab 1 - Networking command line tools                   |
| 2    | Man in the middle<br>Lab 2 - Scapy MITM attack                          |
| 3    | Encryption<br>Lab 3 - RSA encode, decode and crack                      |
| 4    | Network scanning<br>Lab 4 - Multi-VM setup                              |
| 5    | Remote attacks<br>Lab 5 - Identifying VMs by IPIDs                      |
| 6    | Packet analysis<br>Lab 6 - Examine Great Cannon logs<br>Midterm Oct, 29 |
| 7    | Zeek/Bro<br>Lab 7 - Identify quantum insertion                          |
| 8    | Defense<br>Lab 8 - Binary rewriting a C executable                      |
| 9    | Special topics<br>Lab 9 - Identifying HTTPS pages from metadata         |
| 10   | Android Reverse Engineering<br>No Lab - Thanksgiving Break              |
| 11   | Catch up<br>Lab 10 - Honeypots  |
| 12   | Finals Week<br>Dec 11, 10:30 - 12:30                                    |

## Grading

There is a single grade for the lecture and lab portion of this course (i.e., you will get one combined grade taking into account both the lab and lecture).

## Grade Distribution

| Type            | Percent of Final Grade |
|-----------------|------------------------|
| Labs            | 50                     |
| Midterm + Final | 35                     |
| Homework        | 15                     |

The midterm and final may be tests or projects.

## Letter Grade Conversion

| Percent  | Grade |
|----------|-------|
| 92 - 100 | A     |
| 89 - 91  | A-    |
| 86 - 88  | B+    |
| 83 - 85  | B     |
| 78 - 82  | B-    |
| 75 - 77  | C+    |
| 71 - 74  | C     |
| 68 - 70  | C-    |
| 65 - 67  | D+    |
| 62 - 64  | D     |
| 59 - 61  | D-    |
| < 59     | F     |

## General Policies

### Lectures

If you choose not to come to class then please do not use office hours as a substitute for not attending lectures. Those that attend regularly and participate in class discussion will be rewarded accordingly when final grades are calculated! Classroom activities will complement, not necessarily duplicate, the text. Furthermore, you are accountable for material covered in class, so you miss class at your own risk!

### Exams

No makeup exams are given without prior arrangements or in the case of a **documented** emergency after the fact. Exam dates are provided at least a week before they occur, and review sessions may occur preceding each exam.

### Homework/Labs:

Homework, labs, and assignments will be in the form of; programming projects in class labs, written assignments, etc.

- All written assignments must be in PDF format.
- You have 2 free late days, use them wisely!
- Assignments are due by the required time **on the due date**. Late assignments **WILL NOT** be accepted (unless using late days). Do not email me the code, do not post it in Canvas as a comment, just turn your stuff in on time or earlier. You can submit multiple times and we will grade the last submission. In the case of a documented emergency, the instructor reserves the right to accept late work. A doctor's note may not be considered a documented emergency.
- You must submit all files such that your code can be compiled. If your code does not compile because you did not provide the correct/complete files, then you will receive a maximum of 5 points.
- Incomplete submissions/non-compiling code/unreadable PDF files/etc... will not be accepted. Ensure everything is correct before you submit, and all required files are included. You will receive a score of a 0 for incomplete submissions/non-compiling code/unreadable PDF files/etc.
- If the grader/the instructor make a mistake you must discuss the mistake with the instructor immediately.

### Final Grade

Your final grade will be calculated based on the percentages described above.

### Preparation

You are expected to read assigned material before it's discussed in class. Examples given in class and by the authors should be confirmed by the student, to guarantee complete understanding of the subject.

## **Academic Integrity Policy**

Students are expected to uphold a code of ethics and professional behavior that promotes the highest standards of integrity, honesty, trustworthiness, and professionalism when exploring cybersecurity-related topics and exercises. Students are required to sign the NCAE-C Student Code of Ethics and Professional Conduct during the first week of class to proceed in the course. Copies are available by emailing [kriddle2@ewu.edu](mailto:kriddle2@ewu.edu).

Academic Integrity is the cornerstone of the university. Any student who attempts to gain an unfair advantage over other students by violating the Academic Integrity policy may be reported to the university and may receive a sanction up to and including XF for the course, suspension, or expulsion from the university. This policy is on the EWU web site. <https://inside.ewu.edu/policies/knowledge-base/wac-172-90-student-academic-integrity-3/>

Examples of academic dishonesty include misrepresenting others' work as your own, failure to provide proper citations in written text, stealing or destroying material intended for the use of other students, using notes or cell phones during exams, taking photographs of exams, assisting others during exams, copying someone else's work, letting his or her work be copied, and sharing course content without permission.

## **Cheating Policy**

You are allowed to discuss your thoughts with and help other classmates; however, you must do your own work, meaning ALL work should be your own. Plagiarism and cheating **WILL NOT BE TOLERATED**. Plagiarism includes using someone else' programs or parts of programs as your own; copying another person's work; handing in another person's work for your own. If you work with someone else to understand the content, it is important that each person does the assignment separately. Should any of your work be duplicated from another person or any other source, you will be asked to leave the class and not return. Your final grade will be 0.0. Any infractions will be handled in accordance with the academic integrity policy of Eastern Washington University.

## **Americans with Disabilities Act**

Eastern Washington University is committed to providing support for students with disabilities. If you are a student with physical, learning, emotional, or psychological disabilities needing an accommodation, you are encouraged to stop by Student Accommodation and Support Services (SASS), HAR 019 or call 509-359-6871.

## **Religious Accommodations**

If you would like to request an accommodation for reasons of faith or conscience, please refer to EWU's policy on Holidays and Religious Accommodations available at <https://inside.ewu.edu/policies/>. Accommodations must be requested within the first two weeks of this course using the Holidays and Religious Accommodations Request form available at <https://inside.ewu.edu/student-life/resources/holidays-and-religious-accommodations-request/>.

## **Equal Opportunity**

Eastern Washington University does not discriminate in its programs and activities on the basis of race, color, creed, religion, national origin, sex, pregnancy, sexual orientation, gender identity/expression, genetic information, age, marital status, families with children, protected veteran or military status, HIV or hepatitis C, status as a mother breastfeeding her child, or the presence of any sensory, mental, or physical disability or the use of a trained guide dog or service animal by a person with a disability, as provided for and to the extent required by state and federal laws.

## **Recording Devices**

Any type of electronic recording of class is prohibited without my written permission. This is necessary to protect my intellectual property as well as the privacy of students in the class. Recording private conversations without consent is a crime in Washington State.

## **Disruptive Conduct**

Maintaining a productive and respectful learning environment is essential for the success of all students. This classroom is a place for intellectual inquiry, open dialogue, and a commitment to academic integrity. As such, all members of our community are expected to conduct themselves in a manner that supports these goals.

Disruptive behavior is any conduct that unreasonably interferes with the instructor's ability to teach or other students' ability to learn. This includes, but is not limited to:

- Repeatedly arriving late or leaving early in a way that is disruptive to the class.
- Engaging in private conversations or using electronic devices for non-class activities (e.g., texting, social media, browsing unrelated websites).
- Making offensive, harassing, or threatening remarks.
- Arguing with the instructor or other students in a way that shuts down discussion.

**Disruptive conduct violates classroom standards as well as EWU's Student Conduct Code. If a student is disruptive in class, I will take the following steps:**

- Initial Disruption: If a student's behavior is disruptive, I will first attempt to address the issue directly with the student, either during or after class. This may involve a private conversation to understand the situation and clarify expectations for classroom conduct.
- Repeated or Escalated Disruption: If the behavior continues or escalates, I may ask the student to leave the classroom for the remainder of the class session. I will also document the incident and may report it to the Office of Student Rights & Responsibilities for violation of the Student Conduct Code.
- Serious Threats or Emergencies: Any behavior that poses an immediate threat to the safety of others will be reported to immediately to law enforcement.

Students who engage in disruptive behavior may be subject to disciplinary action under the university's Student Conduct Code in addition to being removed from class.

### **EWU Title IX Policy**

Eastern Washington University recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct will NOT be tolerated at EWU. If you have been subjected to sexual misconduct, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct I must report the matter to the Title IX Coordinator. Should you want to report to a confidential source you may contact the following:

- Sexual Assault Family Trauma (SAFeT) – 509-624-7273 – 24 hours
- YWCA Domestic Violence Crisis Line – 509-326-2255 – 24 hours
- Suicide and Mental Health – 509-838-4428 – 24 hours
- Employee Assistance Program (EAP) – 360-407-9490 (employees)
- Counseling and Psychological Services (CAPS) – 509-359-2366 (students)