

COURSE SYLLABUS

CYBE 266

Foundations of Cybersecurity

Course Introduction

Credit Hours: 3

Prerequisite Courses: CS 111 with a minimum grade of C-.

Instructor: Tom Devine, PhD

Class Meets: TR 2:00-3:15; Online

Course Introduction:

An overview of the foundational areas of cybersecurity: data, software, system, human, and organizational security. Students will be required to complete homework assignments and lab activities designed to reinforce computer security concepts and provide hands-on experience in both cyber-attacks and defenses.

Faculty Contact Information

Instructor Office Location: AER 337

Office Hours: MTWRF 1:00-2:00

Instructor Email and/or Phone: thomas.devine@mail.wvu.edu

Instructional Materials

Textbook (RECOMMENDED):

- W. Stallings and L. Brown. Computer Security: Principles and Practice, 4th Edition, Pearson, 2018. ISBN: 9780134794105

Software Tools (REQUIRED):

- [Oracle Virtual Box](#)
 - [SEEDLabs](#)
-

Course Learning Outcomes

1. Describe the fundamental concepts of the cyber security discipline and use to provide system security.
2. Describe potential system attacks and the actors that might perform them.
3. Describe cyber defense tools, methods and components and apply cyber defense methods to prepare a system to repel attacks.
4. Describe appropriate measures to be taken should a system compromise occur.

5. Properly use the Vocabulary associated with cyber security.
 6. Define the 13 fundamental principles of cybersecurity.
 7. Describe why each principle is important to security and how it enables the development of security mechanisms that can implement desired security policies.
 8. Analyze common security failures and identify specific design principles that have been violated.
 9. Given a specific scenario, identify the design principles involved or needed.
 10. Understand the interaction between security and system usability and the importance for minimizing the effects of security mechanisms.
 11. Identify the elements of a cryptographic system.
 12. Describe the differences between symmetric and asymmetric algorithms.
 13. Describe which cryptographic protocols, tools and techniques are appropriate for a given situation.
 14. Describe how crypto can be used, strengths and weaknesses, modes, and issues that have to be addressed in an implementation (e.g., key management), etc.
 15. Identify the bad actors in cyberspace and compare and contrast their resources, capabilities/techniques, motivations and aversion to risk.
 16. Describe different types of attacks and their characteristics.
-

Assessment

Quizzes: There will be approximately 12 quizzes. These quizzes will cover recent lecture material. Quizzes will be given every Tuesday (except for the first week of class and the test weeks) during the first 15 minutes of regular class time. The two lowest quiz grades will be dropped in calculating the quiz average. Quizzes will be administered through eCampus, and only available during their allotted time.

Lab Reports: There will be approximately 5 laboratory activities. The labs will be conducted during regular class time on several Thursdays. Students are encouraged to cooperate and collaborate as they work through the procedures in the labs. However, each student will be required to submit an original lab report detailing the activity. Lab reports must consist of an abstract, introduction, procedures, results, conclusions, and appendices containing any source files or screen shots appropriate for the lab. Lab reports will be graded according to content and form and will be due one week from the completion of the lab.

Misuse of computers and files is a felony in the State of West Virginia!

Assignments: There will be approximately 6 homework assignments. These assignments will address recent lecture material. Assignments will be due one week from the date assigned. The homework assignments will consist of questions from the lecture material posed to encourage the student to question everything and trust (virtually) no one. Assignments will be submitted and received via eCampus.

Failure to put your name on any assignment or lab will result in a 10% deduction to the grade for that assignment or lab.

Midterm and Final: The midterm test will be given during regular class time on Thursday, October 8th. The final exam will be given during our allotted testing time according to the [Registrar's Calendar](#). The final exam is mandatory and there will be no exemptions. Both tests will be administered through eCampus.

Participation: 10 days throughout the semester will be randomly chosen as “Participation Days”. On these days, a random (very simple) quiz will be given through MS Teams. Every student who provides an honest attempt at answering the question posed in the quiz in the allotted time will earn a participation point. Each participation point counts as 0.5% of your final grade. Participation points will be automatically awarded to students with excused absences on participation days.

Weight/Distribution of Course Points:

- Quizzes 20%
- Lab Reports 25%
- Assignments 15%
- Midterm 15%
- Final Exam 20%
- Participation 5%

Expected Timeline of Major Assignments/Assessments and Topics/Units:

- Cybersecurity Foundations [2 weeks]
- Basic Cryptography [3 weeks]
- User Authentication [3 weeks]
- Access Control [3 weeks]
- Malicious Software [3 weeks]

Final Grading Scale:

- A: 90–100%
- B: 80–89%
- C: 70–79%
- D: 60–69%
- F: < 60%

Course Policies

Attendance Policy:

Students are expected to attend classes regularly. However, a student will be able to receive excuses for absences due to legitimate reasons (the instructor may ask for proof). In case of an anticipated absence, the student should inform the instructor ahead of time. In case of an emergency absence, the student should inform the instructor as soon as possible, but not more than one week after return to class.

Grace Period and Missed Exam Policy:

All assignments or labs may be submitted up to 24 hours after their listed due date with no penalty. Assignments or labs submitted more than 24 hours after the listed due date will be assessed a cumulative penalty of 10% per day. For example, given an assignment due at midnight on a Friday worth 20 points, the maximum points possible will be 20 if submitted Saturday, 18 if submitted Sunday, 16 if submitted Monday, 14 if submitted Tuesday, 12 if submitted Wednesday, etc.

There will be NO make-up quizzes or tests. If a student misses a quiz due to an excused absence, that quiz will be dropped. A student anticipating an excused absence from a major test should make arrangements in advance to take it at an earlier time. However, if a student misses a major test due to an excused absence, the final exam grade will replace it. If a quiz or test is

missed as the result of an unexcused absence, the student will be assigned a grade of 0 for that quiz or test.

Academic Integrity Statement:

Any student who plagiarizes a lab report or is found cheating on a quiz/test, will receive a 0 on the given program/quiz/test. This includes both the provider of the information as well as the receiver of the information. A second violation will result in a grade of F in the course. A student who receives help (other than from faculty, official peer mentors, or the textbook), must include citations and references. Taking unacknowledged help is treated as academic misconduct. Each student should carefully read the university policy regarding [Academic Standards](#).

Inclusivity Policy:

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the [Office of Accessibility Services](#).

Diversity Philosophy:

Our philosophy of diversity is based upon an acknowledgement that discrimination — based upon race, ethnicity, gender or gender identity, sex, religion, disability, socioeconomic status and sexuality — is integrated into our foundation as a country and a university. Rather than viewing bias and prejudice as thoughts, statements and actions of a few bad people, we understand that our society has been built to unfairly benefit a select group. As such, WVU has created the [Division of Diversity, Equity and Inclusion](#) to move towards resolving the impacts of this inequality on our campus. Diversity Initiatives is charged with leading this effort by understanding national and local trends, gauging the campus culture of inclusion, educating the community about systemic inequality and empowering students, faculty and staff to advocate for themselves and one another.

Virtual Classroom:

Microsoft Teams will be used to offer a virtual classroom experience that is synchronous and interactive. To attend the virtual class sessions, students need to have access to a computer (or smart phone) with Microsoft Teams installed (or on a web browser). You should have already received a Teams invite to your mix account. If you have bandwidth trouble, try to "Disable Incoming Video" in Teams. This option appears under the 3 dots offering "More Actions" on the bottom center bar. All classroom meetings will be recorded and available in the classroom page. Additionally, lectures will be recorded via offline technologies and made available asynchronously for students unable to attend class.

To join an existing, scheduled meeting, perform the following steps:

- Login to Microsoft Teams
- Select the "Teams" icon on the left
- Select the Class or Office team you want to join
- Look for a post in the Lectures or General channel under the "Posts" tab that has an active meeting
- Click the Join button

Virtual Etiquette:

- Please mute yourself upon entering the room and remain muted until you intend to speak.
- Please feel free to ask questions verbally, if you are able!

Institutional Policies

Institutional Policies:

Students are responsible for reviewing [policies](#) on inclusivity, academic integrity, incompletes, sale of course materials, sexual misconduct, adverse weather, as well as student evaluation of instruction, and days of special concern/religious holiday statements.

COVID-19 Syllabus Statement:

WVU is committed to maintaining a safe learning environment for all students, faculty, and staff. Should campus operations change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. If that occurs, students will be advised of technical and/or equipment requirements, including remote proctoring software.

In a face-to-face environment, our commitment to safety requires students, staff, and instructors to observe the social distancing and personal protective equipment (PPE) guidelines set by the University at all times. While in class, students will sit in assigned seats when applicable and wear the required PPE. Should a student forget to bring the required PPE, PPE will be available in the building for students to acquire. Students who fail to comply will be dismissed from the classroom for the class period and may be referred to the Office of Student Conduct for further sanctions.

If a student becomes sick or is required to quarantine during the semester, they should notify the instructor. The student should work with the instructor to develop a plan to receive the necessary course content, activities, and assessments to complete the course learning outcomes.