School of Cybersecurity

CYSE 301 Cybersecurity Techniques and Operations

2022 Summer

Credits:	3
Instructor:	Peng Jiang
Email:	pjiang@odu.edu (preferred)
Office Hour:	Wednesday 2:00 – 3:00 PM (via Zoom)
Class Time:	TR 4:00 -8:00 PM
Tutor:	Bhawnish Sharma (bshar004@odu.edu)

Textbook & Lab Manual:

- **No** textbook is required for this course.
- **ALL** course materials, including lecture slides and lab manuals, will be posted on the Blackboard.

Prerequisite Course and Knowledge:

- ~~Math 162~~ or permission of the instructor (**Linux Skills**)

How the Course Works

- This course is delivered in a Hybrid mode
- Most lab practices will be performed in the newly introduced CCIA virtual environment.
- Course management is delivered through ~~Blackboard~~ Canvas.
- Assessments are through quizzes, hands-on lab reports, and the final exam.

Course Description and Objectives:

This course focuses on tools and techniques involved in real-world cyber operations. It provides a broad range of cybersecurity concepts and essential hands-on training for students who want to become cybersecurity professionals. Students will learn the basic cybersecurity discipline, underline the model computing environment, and practice different tools and strategies to perform cyber attacks and defense operations.

After completing this course, students will be able to

- understand the rules and laws involved in real-world cyber operations,
- understand the basic components of the model computing networks, and take different techniques to identify and trace the network traffic if an instruction is detected inside a network,
- identify and evaluate the vulnerabilities in the network and implement effective countermeasures to protect the network from possible attacks,
- understand how to plan, organize and perform penetration testing on a network,
- understand different cryptographic protocols, tools, and mechanisms used for different systems, and exploit their weaknesses accordingly,
- manage data and personal information in a secure manner.

Course Outline (tentative list of topics to be covered):

Module 0. Linux Basic
- Introduce the basic Linux operation system

Module 1. Traffic Tracing and Analysis
- Introduce the basic computer network concepts
- Use Wireshark/tshark to trace the network traffic

Module 2. Sword vs. Shield
- Setup pfSense firewall
- Use NMAP to find vulnerabilities

Module 3. Penetration Test
- Introduce Metasploit Framework
- Enumerate system vulnerabilities, and launch attacks on different attack vectors

Module 4. Password Cracking
- Understand how passwords are stored in different systems
- Practice different tools to crack passwords

Module 5. Wireless Security
- Understand the vulnerabilities of the current Wi-Fi networks
- Practice different tools to crack and decrypt the Wi-Fi traffic

Module 6. Digital Steganography
- Understand the technical detail of digital steganography
- Use s-tool/steghide to perform digital steganography

Module 7. Additional Topics
- Practice common software reverse engineering tools to analyze the malware
- Practice command social engineering tools in cyber operations

Course Schedule:

https://held-stream-8e6.notion.site/CYSE-301-Summer-2022-d0bdcada34a0487987e04636b56cab68

Late Policy:

- Lab Report - 10% off per week
- **Quiz – No retake or late submission is allowed.**

Grading Scale (%):

- Quiz 25%
- Final Exam 25%
- Lab Assignments 50%
- Extra Credits Opportunities:
  - Class participation (share meeting notes, etc.)
  - Cybersecurity related extra curriculum activities
  - Extra credit assignments

Total Grade	100-95	94-92	91-90	89-86	85-80	79-75	74-70	69-65	64-60	<60
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D	F

Academic Honesty:

Students are expected to follow the ODU Honor Code for all assignments, quizzes, and examinations. All work that you turn in with your name on it should reflect your work; references are provided at the appropriate places. A first offense will result in the homework/examination/term-paper **grade of zero** for all participants. A second offense will result in **a grade of F** for the course for all participants.

Honor Code

We, the students of Old Dominion University, aspire to be honest and forthright in our academic endeavors. Therefore, we will practice honesty and integrity and be guided by the tenets of the Monarch Creed. We will meet the challenges to be beyond reproach in our actions and our words. We will conduct ourselves in a manner that commands the dignity and respect that we also give to others.

Withdrawal

A syllabus constitutes an agreement between the student and the course instructor about course requirements. Participation in this course indicates your acceptance of its teaching focus, requirements, and policies. Please review the syllabus and the course requirements as soon as possible. If you believe that the nature of this course does not meet your interests, needs or expectations, if you are not prepared for the amount of work involved - or if you anticipate that the class meetings, assignment deadlines or abiding by the course policies will constitute an unacceptable hardship for you - you should drop the class by the drop/add deadline, which is located in the ODU Schedule of Classes. For more information, please visit the Office of the Registrar.