Syllabus

Course Description

ODU Catalog Description

Authentication in cyber systems including password-based, address-based, biometrics-based, and SSO systems; Authorization and accounting in cyber systems; Securing wired and wireless networks; Secured applications including secure e-mail services, secure web services, and secure e-commerce applications; security and privacy in cloud environments.

Instructor Course Description

This course focuses on network security. It begins with a review of various forms of network attacks including port scanning, exploits, buffer overflow, privilege escalation, SQL injection, distributed denial-of-service attacks and arithmetic underflow/overflow. Understand data exfiltration and advanced persistent threats.

Fundamentals of number theory, discrete mathematics and cryptography such as symmetric encryption, message digests, and public key crypto will be studied in depth. Advanced topics in information theory, cryptoanalysis using entropy identifiers will be introduced.

For network stacks, we will look at different security tools and protocols at different layers of network stack such as Layer 3 (IPSEC), Layer 4 (SSL/TLS) and Layer 7 (kerberos). Various defense mechanisms will be introduced. We will also look at intrusion detection systems, viruses, firewalls VPNs and other security tools. Finally, wireless security issues (Layer 2) will also be discussed.

Course Readings

TEXTBOOK (Required)

Network Security Essentials Applications and Standards (5th Edition), William Stallings, Prentice Hall; 5 edition (March 16, 2013). ISBN: 978-0-133-37043-0

(Note: 4th Edition is also acceptable)

Supplement Text (Optional)

Counter Hack Reloaded: A Step-by-Step Guide to Computer Attacks and Effective Defenses (2nd Edition) - Edward Skoudis

Course Objectives

This course gives students a strong foundation on the different topics of network security.

Upon successful completion of this course, students will:

- **Gain experience with the online course system.**
- **Recognize the general purpose and goals of the online course**
- **Gain the importance of network security.**
- **Familiarize with several terminologies that are used to define network, information, and computer security.**
- **Distinguish between different network technologies**
- **Identify different threats, vulnerabilities, and various types of attacks and hacks in network**
- **Identify the role of cryptography in network security and information security**
- **Gain knowledge on digital signatures, digital certificates, and the concept of a public key infrastructure**
- **Solidify mathematical foundations of cryptography, number theory and information theory**
- **Perform basic cryptoanalysis based on entropy on examples such as BASE64 encodings**
- **Familiarize with typical Authentication Systems and Human Authentication Mechanisms**
- **Describe IP security**
- **Explain different security systems to secure transport layer.**
- **Distinguish between different mechanisms for web security.**
- **Analyze the threats of intruders and malicious software**
- **Explain systems for intrusion detections and countermeasures for malicious software**

- **Identify the concept of a firewall, pros and cons, and explains how it functions.**
- **Explains the functioning of virtual private networks (VPNs) and how it works.**
- **Identify the threats and vulnerabilities associated with 802.11 wireless networks**

More specific objectives for each topic are listed within each module.

How the Course Works and Course Schedule

Delivery Method

This online course employs several methods of delivery and learning activities including online lectures and presentations, threaded discussions, Web sites, video clips, reading and written assignments, self-assessment checks, examinations, e-mail, and electronic access of information.

The course is divided into five units:

1. **Introduction to Network Security**
2. **Cryptography**
3. **Network Security**
4. **System Security**
5. **Wireless Security**

The course has two exams and a final exam. The first exam will be at the end of unit 2 while the second exam will be at the end of unit 3. The final exam will be at the end of the course.

Semester **Schedule - See Blackboard**

Grading Criteria

Your grade in this class will be based on the following:

(Note that these percentages are only approximate and are subject to change, but by no more than 10%.)

Homework Assignments	40%	These are to be completed individually.
Exam I	20%	
Exam II	20%	
Final Exam	20%	

Grading Scale

The grading scale is as follows

94-100 =	**A**	90-93 =	**A-**	88-89 =	**B+**
84-87 =	**B**	80-83 =	**B-**	78-79 =	**C+**
74-78 =	**C**	70-73 =	**C-**	0-69 =	**F**

Late Assignments

Any assignment submitted after its deadline is considered late. The following penalties for late assignments apply:

- **0-24 hours late   -10%**
- **25-48 hours late   -20%**
- **Over 48 hours late   not accepted, grade = 0**

This time limit includes weekends -- they are counted just like weekdays.

For example, most of our assignments are due on Sunday. A submission on Monday would have a penalty of 10%, and a submission on Tuesday would have a penalty of 20%. No submissions are accepted after Tuesday.

I reserve the right to specify that late submissions will not be accepted for particular assignments.

Student Responsibilities

Managing Time

Students are expected to spend 10 hours per week on the course materials and assignments. Out of 10 hours, students are expected to spend approximately 3 hours per week to read the material, approximately another 3 hours/week for the homework.

Utilizing Online Components

Refer to the START HERE section within the Blackboard mnenu and the course tour

Online College Classroom Conduct

Netiquette is the accepted behavior for online participation. Students are expected to follow good Netiquette rules. The following is a list of general guidelines for this course:

- Check your grammar and spelling
- Keep your comments focused on the topic
- Strive to write succinctly and clearly
- Share your knowledge and include supportive evidence for your comments
- Do not use all capital letters as that is viewed as shouting
- Avoid flaming—disrespectful language is unacceptable

Please read the The Core Rules of Netiquette <http://www.albion.com/netiquette/corerules.html>

Course Policies

Attendance

Since this is an on-line course, there is no mandatory attendance policy. However, students are expected to actively participate in the discussions, homework submissions, and journal writing. Each of these components is graded and counted toward the final grade.

Getting Help

Please use the discussion forum (in Blackboard) to ask questions about the course material or ask clarifying questions about an assignment. Feel free to answer questions that other students have posted in the Security Cafe forum.

If you need to contact the instructor about a private matter, the best way is through email, but do not expect or rely on an immediate response.

Tests and Make-ups

The same information for homework will apply for tests and make-up work: If a situation has occurred that requires your time and attention which will prevent submitting your work on time, please notify your instructor 24 hours before the scheduled due date

Course Disclaimer

Every attempt is made to provide a syllabus that is complete and that provides an accurate overview of the course. However, circumstances and events may make it necessary for the instructor to modify the syllabus during the semester. This may depend, in part, on the progress, needs, and experiences of the students.

University Policies

Honor Pledge

By attending Old Dominion University, you have accepted the responsibility to abide by the honor code and honor pledge.This is an institutional policy approved by the Board of Visitors.If you are uncertain about how the honor code applies to any course activity, you should request clarification from the instructor.The honor pledge is as follows:

"I pledge to support the honor system of Old Dominion University. I will refrain from any form of academic dishonesty or deception, such as cheating or plagiarism. I am aware that as a member if the academic community, it is my responsibility to turn in all suspected violators of the honor system. I will report to Honor Council hearings if summoned."

Any evidence of an honor code violation (cheating) will result in a 0 grade for the assignment/exam, and the incident will be considered for further review.Evidence of cheating may include a student being unable to satisfactorily answer questions asked by the instructor

about a submitted solution.Cheating includes not only receiving unauthorized assistance, but also giving unauthorized assistance.

Students may still provide legitimate assistance to one another.You are encouraged to form study groups to discuss course topics.Students should avoid discussions of solutions to ongoing assignments or exams and should not, under any circumstances, share solutions for an ongoing assignment or exam.

All students are responsible for knowing the rules.If you are unclear about whether a certain activity is allowed or not, please contact the instructor.

Educational Accessibility

Old Dominion University is committed to ensuring equal access to all qualified students with disabilities in accordance with the Americans with Disabilities Act. The Office of Educational Accessibility (OEA) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations.

If you experience a disability which will impact your ability to access any aspect of my class, please present me with an accommodation letter from OEA so that we can work together to ensure that appropriate accommodations are available to you.

If you feel that you will experience barriers to your ability to learn and/or testing in my class but do not have an accommodation letter, please consider scheduling an appointment with OEA to determine if academic accommodations are necessary.

The Office of Educational Accessibility is located at 1021 Student Success Center and their phone number is (757)683-4655. Additional information is available at the OEA Website.

University Email Policy

The Old Dominion University e-mail system is the official electronic mail system for distributing course-related communications, policies, announcements and other information. A University e-mail user ID and password are necessary for authentication and access to numerous electronic resources (Blackboard, faculty websites, etc.).

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 University Registrar.

Student Acknowledgement Options

"I, _____, have completely read this syllabus and understand and agree to the course requirements."