



Department of Computer Science

CSC 535  
Computer Security I

Course Syllabus  
Fall 2014 (August 20, 2014)

**Class**

CSC 535, Section 1  
Tuesday, 6:00 pm – 9:00 pm  
Robinson Technology Center (RTC), Room 200  
(There are no class meetings during the university final examination period)

**Professor**

Dr. Luay A. Wahsheh  
lawahsheh@nsu.edu  
(757)823-9449  
Office: Robinson Technology Center, Room 310-K  
Office Hours:

- Tuesday, 3:00 pm – 4:30 pm
- Wednesday, 11:00 am – 12:00 pm
- Thursday, 3:00 pm – 4:30 pm
- *Other times by appointment* (contact the instructor via e-mail at least three days in advance)
- There are no office hours during the university final examination period

**Textbooks**

**Required**

- Computer Security: Principles and Practice, 3rd Edition, William Stallings and Lawrie Brown, Prentice Hall, 2015, ISBN-10: 0-13-377392-2, ISBN-13: 978-0-13-377392-7.



## **References**

- Fundamentals of Information Systems Security, 2nd Edition, David Kim and Michael G. Solomon, Jones & Bartlett Learning, 2014, ISBN-13: 978-1-284-03162-1.
- Analyzing Computer Security: A Threat / Vulnerability / Countermeasure Approach, Charles P. Pfleeger and Shari Lawrence Pfleeger, Prentice Hall, 2012, ISBN-10: 0-132-78946-9, ISBN-13: 978-0-132-78946-2.
- Introduction to Computer Security, Michael Goodrich and Roberto Tamassia, Addison-Wesley, 2011, ISBN-10: 0-321-51294-4, ISBN-13: 978-0-321-51294-9.

## **Credit Hours**

Three

## **Prerequisite**

Graduate standing or permission of the instructor

## **Description**

This course is designed for IT professionals to learn computer and network security theories and practices that can be used to significantly reduce the security vulnerability of computers on internal networks or the Internet. The course assumes some familiarity with various operating systems and computer networks. Topics include cryptography, program security, operating systems security, database security, network security, security administration, computer ethics, and legal issues.

## **Course Rationale**

This course is an advanced elective graduate level course

## **Goals and Objectives**

Students will attain basic knowledge of the most important topics in Information Assurance. The students will be able to:

- Understand commonly targeted vulnerabilities.
- Describe various protection mechanisms used to prevent these attacks.
- Understand the theory behind current cryptographic algorithms.
- Understand how to attack encryption systems.
- Describe the threats posed by malicious programs.
- Understand the role played by the operating system in computer security.
- Understand the various attacks against database systems and how to protect them.
- Explain how attackers compromise networks and the shortcomings in the current defense mechanisms.
- Understand the issues in Computer Security administration.
- Distinguish between unethical and illegal activities and understand the responsibility of computer professionals to encourage ethics in the work place.

### **Core Competencies**

- Written and Oral Communication Assumed.
- Mathematical and Quantitative Reasoning Evaluated.
- Information Technology Literacy Evaluated.
- Scientific Reasoning Assumed.
- Critical Thinking Evaluated.

### **Methods of Instruction**

This course is taught using a variety of instructional methods including lecture, laboratory, class discussion, class work (students working individually or in groups), tutorials, readings, problem solving, student presentations to class, or use of guest speakers. Blackboard, an Internet-based education software, will be used. You can access Blackboard at <http://www.nsu.edu/blackboard/>.

Although there is a required textbook for the course (see the section titled Textbooks), I will use material from a variety of resources, including other textbooks and research papers; so the main source for the course will be my lecture notes. I will make my lecture notes available in Blackboard after the relevant lecture. It is your responsibility to obtain notes written on the board and material given or discussed in class that are not available in electronic format; such material will not be available in Blackboard. In order to access class-related material, log in to Blackboard and choose your CSC 535 link. All class-related material will be available in the folder titled CSC 535 Material. If you wish to access more resources, check the Norfolk State University library for resources including e-books and print books.

### **Examinations** (50% of the course grade)

A variety of examinations of equal or varying weight will be given. All class examinations are considered to be a major part of the course work upon which a large part of the course grade depends. You must take all the course examinations. Depending on the situation, a course grade of "F" may be assigned if any examination is missed. There are no make-up examinations. If you have a conflict, you must contact me well in advance of the examination. In case of an extreme emergency, contact me (via e-mail and telephone) within 48 hours after the scheduled examination. If I am not in, leave a message and your number and I will return your call. Acceptable proof of the emergency will be required. Failure to do so will result in an examination grade of zero. It is the instructor's decision to accept or reject the emergency situation.

Please check the Norfolk State University website or contact the Registrar Office to obtain the final examination schedule. I reserve the right to keep all examinations. You will be informed as to the exact format of an examination as well as the format of the questions on an examination. After the examinations have been graded, you have one week to come by and see the examination. After a week, the examinations are no longer in my office and cannot be reviewed.

Cellular phones, headsets of any type, media players, radios, and similar devices are prohibited during examinations and must be turned off before you enter the classroom (see the Course Policies section for more information).

**Homework / Laboratory Assignments** (45% of the course grade)

A variety of assignments of equal or varying weight will be given. All assignments are due at the announced time on the specified due date. Late assignments will not be accepted unless you had a conflict, had contacted me in advance, and I accepted the conflict situation. You have one week after receiving your assignment grade to verify it. No changes to grades will be made after this time. Students should keep all graded assignments until the final grade for the course had been posted.

For this class, it is permissible to assist classmates in general discussions of computing techniques. General advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned homework and laboratory exercises. Do not let anyone copy your work. Students may not “work together” on assignments. Such collaboration constitutes cheating, unless it is a group assignment. A student may not use or copy (by any means) another’s work (or portions of it) and represent it as his or her own. Write your name, the name of the homework (e.g., Homework 1), and your class and section at the top of each assignment.

If you have any questions about the course or need assistance, contact me in person, by phone during office hours, or by e-mail at any time. Any e-mail message for my personal attention must be submitted to my Norfolk State University e-mail account. Use only your Norfolk State University e-mail account to contact me; any message sent to me from a non-Norfolk State University e-mail account will not be read. Do not send e-mail messages for time critical information; e-mail messages may not be read on a daily basis. Always give your name and class when sending e-mail messages. Put “CSC 535: ” at the start of the subject line of your e-mail followed by the specific subject about which you are contacting me.

**Quizzes** (5% of the course grade)

A variety of quizzes of equal or varying weight will be given. A grade of zero will be assigned for any missed quiz unless you had a conflict, had contacted me in advance, and I accepted the conflict situation. You have one week after receiving your quiz grade to verify it. No changes to grades will be made after this time. Students should keep all graded quizzes until the final grade for the course had been posted. I may drop your lowest quiz score when your quiz average is computed.

**Grading System**

The final grade for the course will be computed as follows:

Examinations. . . . .	50%
Homework / Laboratory Assignments. . . . .	45%

Quizzes..... 5%

The final grade for the course will be computed using the following scale:

<b>Letter Grade</b>	<b>Percentage Value*</b>	<b>GPA Value (per credit hour)</b>
A	90 – 100	4.00
B+	87 – 89.9	3.30
B	80 – 86.9	3.00
C+	77 – 79.9	2.30
C	70 – 76.9	2.00
F	0 – 69.9	0.00

\* I reserve the right to lower these values if necessary.

Class attendance, participation, and other contributions may be taken into consideration in the final calculation of the course grade, especially in the case of borderline grades (within a certain percentage of grade threshold). A case-by-case decision will be made whether to assign the next higher grade.

The instructor expects students to write organized answers to essay-style questions. Answers that have weak organization may result in a penalty. For example, an answer was so disorganized that it took significant work to find the relevant material in the mass of irrelevancy. Do not miss the point of the question and spend a lot of space on irrelevant material. If you do not know the answer to a question, leave the question blank. Inappropriate use of the English language, including grammar, punctuation, spelling, and capitalization may result in a penalty. The instructor expects students to write legibly; sloppy handwriting may result in a penalty.

Extra credit work and/or points may be given. If circumstances beyond the student's control prevent completion of course requirements, a student may request an incomplete grade from the instructor. It is the instructor's decision to grant or deny a request for an incomplete grade. Requests for an incomplete grade must be made on or before the date of the final examination. Depending on the situation (especially in an emergency situation that had prevented a student from taking the final examination), requests for an incomplete grade may be made after the final examination as long as the final grades for the course had not been entered into the university's academic computer grading system. The final grades for the course will be available to students immediately after they are electronically submitted. The final grades will be submitted by the university final grade submission deadline (which can

be found on the university website). Please note that submitted grades cannot be updated.

Student preparation and presentation of research or tutorial papers on topics/tools related to computer security will be required. Extra credit may be given for submitting student research papers for review to peer-review conferences or journals.

### **Tutoring**

The College of Science, Engineering, and Technology provides tutoring services through the STARS Tutoring Program for those Norfolk State University students who may be experiencing difficulties in Computer Science, Mathematics, Engineering, Biology, Chemistry, Nursing, Technology, and Physics courses. STARS offers one-on-one or group tutoring. This service is free of charge and provided to Norfolk State University students only. The STARS office is located in the Robinson Technology Center, Suite 100. You can access information about this service by going to <http://stars.nsu.edu/>.

### **Course Policies**

The Department of Computer Science adheres to the Norfolk State University policy on class attendance. The university expects students to attend all classes. While unnecessary absences are discouraged, the university recognizes that, on occasion, students may have legitimate reasons for being absent. Not more than 20% of class meetings (excused and/or unexcused) may be missed by a student during a given semester. Please read your student handbook for more details.

Class attendance is a very important aspect of a student's success in this course. Please enter the classroom only after the previous class has finished. Roll will be taken regularly at the beginning of class. If you are not in class when I call roll, you are absent. If you come in late, your tardiness will be noted and you will be penalized, including taking points off from your course grade and/or counting it as an absence. If you are absent from class, please do not come by my office and ask me to repeat the class lecture. In order to eliminate class disruptions, please do not come to class late or leave early. No one may enter the classroom once class has started. Students are expected to stay in the classroom the entire time. If there is an emergency and you need to leave early, notify me before the class. Please refrain from packing your belongings before the end of class. There is no smoking, no chewing tobacco, no chewing gum, no eating or drinking, no bare feet, and no sleeping in the classroom. Trash must be thrown away in the trash bin. You may not sit on the classroom tables. Cellular phones, headsets of any type, media players, radios, and similar devices are prohibited in the classroom and must be turned off before you enter the classroom. You may not use your cellular phone for text messaging. No cellular phone may be visible to me at anytime. If you expect an important message, inform me before class starts. Recording devices are not permitted; if you wish to record the lecture for further study, you need to get approval from me.

Calculators and computers are prohibited during examinations and quizzes, unless specified. Laptop computers may be used in lecture for the purpose of taking notes only. I have the

right to ban laptop computers in the classroom at anytime without specifying a reason. You must not use the classroom computers unless you are asked to do so by the instructor. You may not sit at the instructor's desk or use his computer without permission. Students are expected to exhibit proper classroom behavior and language, and not engage in any behavior that would be disruptive to other students and/or the instructor. If you have a question, raise your hand and ask the instructor; do not ask other students. Talking to others while I am speaking will not be tolerated. Please take all of your personal belongings at the end of the class meeting. I am not responsible for any belongings that are left in the classroom. Only students officially registered for the course and approved assistants may attend class. Please bring your textbook, lecture notes, and relevant material to every class meeting.

Graded work will be given in class. If you missed class, it is your responsibility to stop by my office during office hours to pick the graded work. I will not post any course grade in Blackboard. Graded work will be given in class. However, if you wish to find out your grades and/or where you stand in class, please contact me via e-mail to set up an appointment so I could bring my grade book. I will not give out grades via e-mail, phone, or mail (unless I find it necessary to do so); meet with me in person to see your grades. When asked to do work (examination, assignment, or quiz) in class, you must turn in the work to the instructor; do not leave class with any work. Students who leave class with any work will be penalized.

If you have a conflict or emergency that will prevent you from attending class, you must contact me before the class session begins. Please submit complete, official documentation that can verify your absence. You have up to three days from the starting time of the missed class to submit the documentation. It is the instructor's decision to accept or reject the conflict or emergency situation. If I approve your absence, please immediately make arrangements with me to make up the missed work. The make-up work has to be taken within a week from the starting time of the class that you missed. Not taking the make-up work within a week may result in a grade of zero for the work that you missed.

When you send me an e-mail message, I will acknowledge the receipt of your message. If you need my signature or any information to include on any report including grade progress report, I ask you to give me two weeks notice. If you have any privacy concerns regarding disclosing your Norfolk State University e-mail address, please inform me during the first week of school.

Check your Norfolk State University e-mail account daily for information regarding this course. Please do not leave your homework assignments or any other work under my office door or the Department of Computer Science's office door; do not leave your homework assignments or any other work in my department mail box, unless specified. Please do not bring food or drinks to class. Students are expected to abide by the Norfolk State University Spartan Code of Ethics. I reserve the right to change this syllabus at any time. I will notify you of any change through verbal and/or written notification.

### **Academic Honesty**

All class assignments are to be done independently, unless specified. If in my judgment a student is found cheating on an examination, assignment, or quiz, the student will be penalized. I consider the person who did the work (examination, assignment, or quiz) and the person copying the work as both cheating. Students should save all developmental copies of their assignments so that individual assignment development can be verified to me if I think it is necessary.

The Department of Computer Science employs a no tolerance policy on cheating. Cheating includes, but is not limited to, copying others work, misrepresenting the work of others as your own (including online sites), plagiarism, sharing when unauthorized, and the use of cellular phones and/or electronic media when unauthorized. The following outlines the departmental procedure if a student is suspected of cheating during his or her academic tenure with the Computer Science Department at Norfolk State University.

- Offense 1 – The student will receive a grade of zero on the assignment and a note will be placed in the student’s permanent departmental file. Non-Computer Science Majors will receive a zero and be reported to the chair of their respective department.
- Offense 2 – The student will receive a letter grade of “F” for the course and the student will be reported to the Office of Student Rights and Responsibilities for adjudication.

### **Special Accommodations**

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, we ask if you have a disability or think you have a disability please make contact with the Disability Services Department.

Location: Student Service Center, Suite 110

Contact Person: Ms. Janet L. Timberlake

Phone: (757)823-8325

If you are unable to submit class work in time, it is your responsibility to request an extension in advance, within 24 hours of assigning the work. If you have not requested an extension in advance, you may not be given extra time. If you need special arrangements (e.g., to take an examination outside the classroom), you should make a request to me two weeks in advance.

### **University Policies and Procedures**

All students attending Norfolk State University are required to abide by the laws of the Commonwealth of Virginia and the rules and regulations of Norfolk State University. A student who violates the class and/or Norfolk State University policies and procedures may be subject to administrative actions and/or disciplinary sanctions, including a grade sanction. Please read the Norfolk State University Student Disciplinary Policies and Procedures handbook for more details.

## **Schedule of Topics\*\***

(This schedule is tentative and subject to change at the discretion of the instructor.)

- Chapter 1: Overview
- Chapter 2: Cryptographic Tools
- Chapter 3: User Authentication
- Chapter 4: Access Control
- Chapter 5: Database and Cloud Security
- Chapter 6: Malicious Software
- Chapter 7: Denial-of-Service Attacks
- Chapter 8: Intrusion Detection
- Chapter 9: Firewalls and Intrusion Prevention Systems
- Chapter 10: Buffer Overflow
- Chapter 11: Software Security
- Chapter 12: Operating System Security
- Chapter 13: Trusted Computing and Multilevel Security
- Chapter 14: IT Security Management and Risk Assessment
- Chapter 15: IT Security Controls, Plans and Procedures
- Chapter 16: Physical and Infrastructure Security
- Chapter 17: Human Resources Security
- Chapter 18: Security Auditing
- Chapter 19: Legal and Ethical Aspects
- Chapter 20: Symmetric Encryption and Message Confidentiality
- Chapter 21: Public-Key Cryptography and Message Authentication
- Chapter 22: Internet Security Protocols and Standards
- Chapter 23: Internet Authentication Applications
- Chapter 24: Wireless Network Security

\*\* Other advanced topics in computer security and other course-related areas may be studied. The topics will vary depending on current research directions in computer security and course-related areas, including security policy engineering, wireless network security, software security, database security, reading, writing, and research.