

NORFOLK STATE UNIVERSITY

CSC760 Secure Software Development (3 credit hours)

Spring 2012: Monday & Wednesday 3:00 – 4:30, RTC 202

Instructor: Dr. Thorna Humphries, Associate Professor of Computer Science

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Hours: Tu 10:30-12:00, 3:30-4:30, W 10:30 – 12:00, 4:40-5:30, Th 3:30-4:30, other times by appt.

COURSE DESCRIPTION, PRE-REQUISITES, CO-REQUISITES

This course is a graduate elective course in the Information Assurance Track. It introduces basic concepts and latest research trends and results in developing secure software. Topics include the best practices in developing secure software within Software Development Lifecycle (SDLC).

PREREQUISITES:

Graduate Standing

COURSE RATIONALE

Developing secure software systems has become a challenge due to the complexity of the systems. According to CERT Coordination Center, the number of vulnerabilities reported daily has increased significantly. In addition to the above, the US spends billions to repair systems caused by software errors according to the National Institute of Standards and Technology. Thus security issues must be addressed across the entire software development lifecycle. In this course, basic concepts and the latest research trends and results with respect to secure software development will be cover. Students will be exposed to the following topics:

1. Goals and technical trends of software security
2. Security requirements
3. Software vulnerabilities
4. Risk analysis
5. Security Analysis and verification
6. Software security testing
7. Legal and ethical issues

COURSE GOALS AND MEASURABLE INTENDED STUDENT LEARNING OUTCOMES

The major goals of the course:

- To introduce basic concepts on secure software development.
- To introduce latest research efforts on developing secure software.

Upon completion of this course, students should

- Be able to understand secure software engineering principles that are introduced in course and apply them to develop more secure software.
- Adopt best practices in the development of software
- Be able to identify known software vulnerabilities
- Be able to describe and apply software analysis and testing and verification techniques covered in course.

COURSE MATERIALS / REQUIRED TEXT(S) / SUPPLEMENTARY READINGS

Text: *Building Secure Software: How to Avoid Security Problems the Right Way*, John Viega and Gary McGraw, Pearson, 2001.

ISBN-13: 9780201721522

ISBN-10: 020172152X

Websites:

- NIST Computer Security Division, <http://csrc.nist.gov/>
- SANS Institute, <http://www.sans.org/>

PRIMARY METHOD(S) OF INSTRUCTION / METHODS TO ENGAGE STUDENTS

The primary method of instruction will be lectures by the instructor. Students will also participate through class and group discussions.

COURSE OUTLINE / CALENDAR (Expectations for Student Engagement in the Course)

Week	Chapter (Topic)
1	Introduction to Software Security
2	Security and Software Engineering (historical/future perspectives)
3	Security and SDLC
4	
5	Process and Requirements
6	
7	Midterm Exam/Introduction of Project
8	Software Vulnerabilities
9	Break (March 9 – 13)
10	Software Vulnerabilities
11	Software Analysis and Verification Architecture and Design
12	2 nd Test
13	Security Testing
14	Legal and Ethical Issues
15	Presentation on Final Project

The schedule is subject to change at the discretion of the instructor or depending upon the progress of the class.

RELATED UNIVERSITY-WIDE AND COURSE-SPECIFIC REQUIREMENTS

This course will require that students use and enhance the following skills.

- **Writing**
- **Information Technology Literacy**
- **Oral Communication**
- **Critical Thinking**

EVALUATION / ASSESSMENT METHODS

Students will be evaluated through examinations, article reviews, homework assignments, laboratory exercises, and a final project.

GRADING STANDARDS / EVALUATION CRITERIA

Tests.....	40%
Test1.....	20%
Test2.....	20%
Assignments/Presentations.....	35%
Final Project.....	25%

>= 59	F
60 - 74	C
76 - 79	B-
80 - 85	B
86 - 89	B+
90 - 100	A

- **I Grade** - No incomplete grades will be given except for illness or other tragic circumstances. In either case, proof of the circumstance must be provided.
- **Presentations**- All students will be required to make PowerPoint presentations on topics and participate in class discussions. Each presenter must be prepared to answer questions on their subject matter. These questions will come from other students in the class as well as the professor.
- **Late Assignments** - All assignments are expected at the due date. Each student has two late passes. After these are used, assignments and labs that are not turned in on time will be penalized a letter grade for each day that they are late, weekends included. Late passes cannot be applied to the project.
- **Make-up Exams** - It is the responsibility of the student to arrange a make-up exam. The student must provide an official university excuse.
- **Class Participation** - Class participation is not averaged into your grade. However, it will be used to determine borderline grades.

ACADEMIC INTEGRITY STANDARDS

The Computer Science Department adheres to the University Policy on class attendance. The University Policy states the following:

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. Thus, a student will be permitted one “unexcused” absence per semester hour credit or the number of times a given class meets per week. Once a student exceeds the number of allowed unexcused absences, an instructor may require an official university excuse. Not more than 20% of class meetings (excused and/or unexcused) may be missed by a student during a given semester.

At the discretion of the instructor, a student whose absences exceed 20% of scheduled class meetings for the semester may receive a grade of “F” for the course.

Students have the responsibility to confer with their instructors regarding all absences or intended absences. If sudden departure from the campus (for an emergency or extraordinary reason) prevents a student from communicating with each of his or her instructors, the student is expected to notify the Office of Student Services/Judicial Affairs within 48 hours. Class excuses are issued for legitimate reasons (medical, funerals--immediate family members only, official university business/activities, etc.) by the Office of Student Services/Judicial Affairs. Official written documentation may be required. Notes from relatives, friends, etc., are not accepted as “official” documentation for absences. The Office of Student Services/Judicial Affairs will determine if an absence is legitimate and if an excuse will be issued.

Students who become ill are encouraged to report to the Student Health Center, located in Spartan Station, for “minor” medical treatment. A current NSU ID card must be presented prior to treatment. Written verification of illness issued by the Health Center should be carried to the Office of Student services/Judicial Affairs, and an official University excuse should be obtained. Students residing in on-campus housing facilities are governed by the same policies and procedures as non-residential students insofar as class attendance and class excuses are concerned.

Expectations concerning Student conduct are as follows:

- Students are encouraged to actively participate in class.
- Students are expected to arrive on time to class.
- Students are expected to abide by the ACM Code of Ethics.
- Students should place phones on pager or silent mode upon entering class.

BLACKBOARD INSTRUCTIONS

All PowerPoint presentations, homework assignments, and laboratory assignments will be posted via Blackboard.

AMERICANS WITH DISABILITIES ACT (ADA) STATEMENT

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

Location: Student Services Building Suite 110, Room 110D

Contact Person: Marian Shepherd - Coordinator DS

Telephone: 757-823-2014

Email: mshepherd@nsu.edu

UNIVERSITY ASSESSMENT STATEMENT

As part of NSU's commitment to provide the environment and resources needed for success, students may be required to participate in a number of university-wide assessment activities. The activities may include tests, surveys, focus groups and interviews, and portfolio reviews. The primary purpose of the assessment activities is to determine the extent to which the university's programs and services maintain a high level of quality and meet the needs of students. Students will not be identified in the analysis of results. Unless indicated otherwise by the instructor, results from University assessment activities will not be computed in student grades.