CSC 666–Secure Software Engineering
Spring 2017
M 6:15-9:00
GH 312

Instructor Information

Name	James Walden		Office Hours	
E-mail	*waldenj@nku.edu*	MWF	2:00-3:00pm
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Summary

Description : Secure software engineering focuses on creating software that functions correctly even when attacked. Topics include common software vulnerabilities, risk analysis, misuse cases, secure design principles and patterns, secure programming techniques, code reviews, and security testing. Students need to have a basic level of understanding of both software engineering and information security before taking this course.

Prerequisites : CSC 540: Software Engineering
CSC 582: Computer Security

Textbooks : Gary McGraw, *Software Security*, Addison-Wesley, 2006.
Christian Bird, Tim Menzies, and Thomas Zimmerman, *The Art and Science of Analyzing Software Data*, 2015.
Garrett Grolemund and Hadley Wickham, *R for Data Science*, 2016.

Student Learning Outcomes

By the end of the course, a successful student should be able to

1. Explain the threats, attacks, and vulnerabilities that create the need for software security.

2. Describe changes that can be made to the software development lifecycle to improve security.

3. Collect, analyze, and visualize software project data.

4. Develop and compare predictive models for software engineering projects.

Grading

Your grade in this course will be based on the four types of assessments described below.

Paper Reviews (20%) Students will review one paper from the empirical software engineering literature each week. The review should be approximately one page in length and must follow a format specified by the instructor. Students must bring their reviews as hardcopy to class to use as a reference during class discussions and to be handed in to the instructor at the end of the class period. Paper reviews are not accepted late unless a prior arrangement is made with the instructor.

Activities (20%) In-class activities help you understand the practical aspects of security engineering. Most activities will include group work. Bring your laptop to class, so that you can work on the activities. Some activities will be completed within a single class period, while other activities will require time outside of class to complete and are due at the next class period. Activities are not accepted late.

Assignment (30%) A replication of a data-driven analysis of a software project. Students will need to read the original analyses, import and process the provided replication data, replicate the original analysis and visualizations, and write an 8 page report in IEEE conference paper format. This assignment may be done as an individual or as part of a group.

Final Project (30%) An individual data-driven analysis of a software project. Students develop research questions, identify data sources, collect and clean data, and produce visualizations and a predictive model to answer the research questions. While the project may be based on a replication, it must extend the replication in some significant manner. Students must write a 10-page report in IEEE conference paper format and make a presentation on the project during finals week.

Your letter grade in this course will be computed using the table below.

Grade	Percent	Grade	Percent
A	93-100	C+	77-80
A-	90-93	C	73-77
B+	87-90	C-	70-73
B	83-87	F	0-70
B-	80-83		

CREDIT HOUR POLICY

In accordance with federal policy, NKU defines a credit hour as the amount of work represented in the achievement of student learning outcomes (verified by evidence of student achievement) that reasonably approximates one hour (50 minutes) of classroom instruction and a minimum of two hours of out-of-class student work. For every course credit hour, a typical student should expect to spend at least three hours per week of concentrated attention on course-related work including, but not limited to, class meeting time, reading, reviewing, organizing notes, studying and completing assignments. At least an equivalent amount of time is expected for other academic activities such as online courses, laboratory work, internships, practica, studio work and other academic work leading to the award of credit hours.

Estimates of the time required for a typical student to complete course expectations are:

In-Class (1 days x 150 min x 15 weeks)	37.5 hours
Class Preparation (2 hours x 15 weeks)	30 hours
Assignment	25 hours
Project	50 hours
TOTAL	**142.5 hours**

Course Topics and Calendar

See the course web site, http://faculty.cs.nku.edu/~waldenj/classes/2017/spring/csc666/ for a current course calendar with links to readings, slides, and assignments.

COMMUNICATION POLICY

Students should check the class web site for announcements and new course materials in the 24 hours before each class period. Students should also check their NKU e-mail accounts for important course and university announcements, such as snow days and other schedule changes.

Students are encouraged to ask questions in person or via telephone during faculty office hours or via e-mail at any time. E-mail messages should be from your NKU e-mail account and must include:

- A subject line beginning with the class number and including a summary of your question, e.g. "CSC 666: Microsoft Threat Modeling tool crashes with error 55555".

- A detailed description of the problem. Specify precisely on which assignment, machine, user account, and software the problem occurred and provide a list of steps needed to reproduce the problem.

- The message should close with your full name.

The instructor will answer e-mail following the above guidelines within one business day.

STUDENTS WITH DISABILITIES

Students with disabilities who require accomodations (Academic adjustments, auxiliary aids or services) for this course must register with the Disability Services Office. Please contact the Disability Service Office immediately in the University Center, Suite 320 or visit the website at http://disability.nku.edu/ for more information. Verification of your disability is required in the Disability Services Office for you to receive reasonable academic accomodations.

HONOR CODE

The Student Honor Code is a commitment by students of Northern Kentucky University, through their matriculation or continued enrollment at the University, to adhere to the highest degree of ethical integrity in academic conduct. It is a commitment individually and collectively that the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements.

The purpose of the Honor Code is to establish standards of academic conduct for students at Northern Kentucky University and to provide a procedure that offers basic assurances of fundamental fairness to any person accused of violations of these rules. Each Northern Kentucky University student is bound by the provisions of the Honor Code and is presumed to be familiar with all of its provisions. Students also should aspire to conduct themselves in a manner that is consistent with the highest degree of ethical integrity in all matters, whether covered in the Honor Code or not. The success of this commitment begins in the diligence with which students uphold the letter and the spirit of the Honor Code. Students may view the complete honor code at http://deanofstudents.nku.edu/policies/student-rights.html#policies.

STUDENT EVALUATIONS

Northern Kentucky University takes Instructor and Course Evaluations very seriously as an important means of gathering information for the enhancement of learning opportunities for its students. It is an important responsibility of NKU students as citizens of the University to participate in the instructor and course evaluation process. During the two weeks prior to the end of each semester's classes, you will be asked to reflect upon what you have learned in this course, the extent to which you have invested the necessary effort to maximize your learning, and the role your instructor has played in the learning process. It is very important that you complete the online evaluations with thoughtfully written comments.

Student evaluations of courses and instructors are regarded as strictly confidential. They are not available to the instructor until after final grades are submitted, and extensive precautions are taken to prevent your comments from being identified as coming from you. Students who complete an evaluation for a particular course (or opt out of doing so in the evaluation) will be rewarded for their participation by having access to their course grade as soon as that grade is submitted by the instructor. On the other hand, any student who does not complete the course evaluation (or opt out of doing so in the evaluation) should expect to incur a two week delay in access to his or her course grade beyond the university's official date for grade availability. To complete online evaluations go to http://eval.nku.edu/. Click on "student login" and use the same username and password as used on campus.

In addition, you should be aware that:

- Evaluations can effect change in courses. Evaluations without comments are less valuable and less credible than those filled out thoughtfully. Comments that are expressed well are more effective than those that are not.

- Positive feedback is just as important as criticism. Moreover, negative evaluations without any explanation and specifics are not especially useful.

- Once grades are submitted, all evaluations are read not only by the instructor, but also by the instructors department chairperson.

- Evaluations not only provide feedback to your instructor, but also provide information to the department chair for use in performance evaluations. This information affects reappointments, promotions, salaries, and teaching assignments.