CIT 480/580–Securing Computer Systems

Fall 2017 (TR 10:50-12:05 in GH 160)

http://faculty.cs.nku.edu/~waldenj

INSTRUCTOR INFORMATION

Name	James Walden
E-mail	*waldenj@nku.edu*
Office	GH 526
Phone	(859) 572-5571

Office Hours	
M	7:30-8:30pm
W	2:00-3:00pm
TR	10:00-10:40am
also	by appt

SUMMARY

Description	:	An introduction to the concepts and technologies of computer security, with a focus on the practical aspects of securing computers, including common security threats and computer crime, authentication, cryptography, malware, operating systems security, and network security.
Prerequisites	:	CIT 371: System Administration
Textbooks	:	Michael T. Goodrich and Roberto Tamassia, *Introduction to Computer Security*, Pearson, 2011, ISBN: 978-0-321-51294-9.

STUDENT LEARNING OUTCOMES

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

1. Explain common security threats and attacks, including malware.

2. Identify security vulnerabilities in computer systems.

3. Apply authentication and cryptography to secure computer systems.

4. Use open source tools to improve system security.

5. Understand the fundamentals of network security.

6. Describe the processes of auditing and incident response.

7. Understand ethical and legal considerations of working in information security.

GRADING

Your grade in this course will be based on the following classes of assessments, each of which counts for the specified percentage of your semester grade.

Class Preparation (20%)   For each class meeting, you will be assigned questions to answer based on the readings for that class period. To receive credit for class participation, you must bring a printed sheet with answers to these questions with you to class and turn them in before the end of the class period. No late or electronic answers will be accepted. The preparation questions will be graded on a pass/fail basis. Your answers will be evaluated on how well you demonstrated preparation for class, not on getting a particular correct answer. In addition to being worth 20% of your semester grade, these questions will help you prepare for the midterm and final exams, so take notes on the instructor's discussion of these questions in class.

Security Labs (20%)   Labs help you understand the practical aspects of security. While you will be given time in class to begin working on labs, labs will typically require time outside of class to complete and are due at the next class period. Labs will be accepted up to one week after the lab was originally due. Late labs will incur a 20% grade penalty.

Security Project (10%)   The project is a security assessment of a set of network devices configured by the instructor. The project will be completed entirely outside of class over the course of a couple of weeks and will require you to apply the skills learned in labs throughout the semester. Security tools and references listed on the Resources page of the course web site will be helpful in completing the project. It will be due in the last week of class before finals week. No late projects will be accepted under any circumstances.

Midterm Exam (25%)   The midterm examination will cover all material up until the class period during which it is given. It will consist of a set of short answer and essay questions, most of which will be similar to the questions assigned as class preparation exercises. You will have an entire 75-minute class period to complete the exam. The date is on the class schedule web page.

Final Exam (25%)   A comprehensive examination covering all of the material in the course given during finals week in a two hour period. The format will be the same as that of the midterm exam. The date is on the class schedule web page.

Graduate students taking this class as CIT 580 must complete a research paper on a computer security topic approved by the instructor. This paper will be worth 10% of the final grade, while the class preparation will count for only 10% of the final grade for CIT 580 students. The research paper is described in detail on the class web site.

No late work will be accepted without prior arrangement or a documented illness or emergency, except late labs as described above.

Your letter grade will be based on your percentage score from the sum of the assessment areas above as shown in the table below.

In accordance with university policy, mid-term grades will be available online through MyNKU and are issued to all undergraduate students. These grades are not part of your permanent record and will be replaced

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	D+	67-70
B-	80-83	D	60-67
		F	0-60

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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		

when final grades are submitted. Remember: mid-term grades do not guarantee a good or bad class grade; they reflect the current level of performance and can be altered by the quality of subsequent work.

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 (2 days x 75 min x 15 weeks)	37.5 hours
Class Preparation (2 hours x 15 weeks)	30 hours
Labs (out of class time)	37.5 hours
Project	30 hours
TOTAL	135 hours

COURSE TOPICS AND CALENDAR

This course will cover the following topics and chapters of the textbook:

1. Security Fundamentals (chapter 1)
2. Authentication and Passwords (chapter 2)
3. Access Control (chapter 2)
4. Operating Systems Concepts (chapter 3)
5. Operating Systems Security (chapter 3)
6. Software Security (chapter 3)
7. Malware (chapter 4)
8. Network Security (chapter 5)
9. Firewalls (chapter 6)
10. Intrusion Detection Systems (chapter 6)
11. Wireless Security (chapter 6)
12. Web Application Security (chapter 7)
13. Cryptography (chapter 8)

See the course web site, http://faculty.cs.nku.edu/~waldenj/classes/2017/fall/cit480/ for a detailed course calendar with readings, labs, assignments, and notes.

RESOURCES AND REFERENCES

Information security resources specific to this course can be found via the Resources link, while information security resources for the university and local area can be found at the Center for Information Security page, http://cis.nku.edu/.

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. "CIT 480: Metasploit will not start on my Kali VM".

- 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

The University is committed to making reasonable efforts to assist individuals with disabilities in their efforts to avail themselves of services and programs offered by the University. To this end, Northern Kentucky University will provide reasonable accommodations for persons with documented qualifying disabilities. If you have a disability and feel you need accommodations in this course, you must present a letter to me from the Disability Programs and Services Office (SU 303), indicating the existence of a disability and the suggested accommodations. More information can be found at http://disability.nku.edu.

HONOR CODE

The Student Honor Code (the "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.