

CSCI 5362 –PENETRATION TESTING

CREDIT HOURS: 3

PREREQUISITES: Admittance into the graduate program Cyber Security

RECOMMEND PREREQUISITE COURES:

CSCI 3341 Algorithm Analysis;

CSIT 4355 Enterprise Security or CSCI 4347 Cyber Security Concepts and Practice

CATALOG DESCRIPTION

Examination of the techniques and technologies for the penetration of networks, detection of attacks, and prevention of attacks. Addresses the techniques, technologies, and methodologies used by cyber intruders (hackers) to select a target and launch an attack. Assesses the various countermeasures to keep the system out of the “sights” of the hacker and to keep the hacker out of the perimeter of the target network. Explores the laws and the legal considerations in prosecuting computer crime.

PURPOSE OF COURSE

To study techniques and technologies to detect cyber attacks even while the attack is in progress. To permit early detection of system vulnerabilities, permitting an administrator to track the movements of the hacker and to discover the intent and goals of the hacker, and thereby provide a good defense. To study and understand the mind and psyche of the hacker is essential to anticipating the actions and reactions of the hacker and to design effective countermeasures. Covers penetration testing to aid in discovery or prevention of cyber attacks.

EDUCATIONAL OBJECTIVES

Upon successful completion of the course, students should be able to:

1. Explain how attackers map organizations, and be able to describe common port scanning techniques
2. Identify some of the tools used to perform enumeration
3. Explain the significance of wireless security
4. List the issues facing Web servers
5. Describe the characteristics of malware, and be able to explain an understanding of the ways of detecting Trojans
6. Describe the process of DoS attacks
7. Describe the benefits of automated assessment tools, and be able to list the components of incident response
8. List the detective methods of defense

COURSE CALENDAR

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant assignments based on readings from the primary literature, participate in classroom discussions regarding current research topics, complete periodic homework and laboratory/programming assignments, and periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

CONTENT

Hours

Introduction.....	3
Classes of hackers	
Attack detection	
Defense against attacks	
Penetration Testing	
Footprinting.....	9
Footprinting Tools and Techniques	
Ports and Port Scanning	
NMAP lab	
Web and Database Attacks	12
Viruses	
Malware	
Worms	
SQL Injection	
Trojans and backdoors	
Session hijacking	
DOS (Denial of Service) Attacks	
Prevention	6
Linus, PC and OSX prevention	
Live CDs	
Bootable USBs	
Automated and on-demand assessment tools	
Penetration Testing	9
Ethical Penetration Testing	
Methods and techniques	
Exams (plus final).....	6
	TOTAL 45

REFERENCES

Sean Philip and Michael Gregg, Hacker Techniques, Tools, and Incident Handling, Jones & Bartlett Learning, 2011

George Weidman, Penetration Testing: A Hands-On Introduction to Hacking, No Starch Press, 2014

James Patterson, Hacking: Beginner to Expert Guide to Computer Hacking, Pasic Security and Penetration Testing, Amazon Digital Services, 2016

Edward Skoudis and Tom Liston, Computer Hack Reloaded: A Step by Step Guide to Computer Attacks and Effective Defenses, 2nd Ed, Prentice Hall, 2007

Attendance Policy:

Attendance will be taken at the beginning of each class. If you have 3 unexcused absences, then your final grade will be reduced by one letter grade. If you have 4 unexcused absences, you will receive an "F" in the course. To receive an excused absence a written and signed notice is required within three class days of the absence. If you miss class without approval of your instructor, you will receive a grade of zero on the missed assignment. Authorized absences must be approved by your instructor in advance of the absence unless you have an emergency or illness. Make-up work must be completed outside of normal class hours and within one week following an excused absence. It is your responsibility to see your instructor and make arrangements for make-up work.

Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty

Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades - Semester Grades Policy (A-54)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to <http://www.sfasu.edu/disabilityservices/>.

Mental Health Statement

SFASU values students' mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students' mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:

SFASU Counseling Services
www.sfasu.edu/counselingservices
3rd Floor Rusk Building
936-468-2401

SFASU Human Services Counseling Clinic
www.sfasu.edu/humanservices/139.asp
Human Services Room 202
936-468-1041

Crisis Resources:

Burke 24-hour crisis line 1(800) 392-8343
Suicide Prevention Lifeline 1(800) 273-TALK (8255)
Crisis Text Line: Text HELLO to 741-741