Network Security COSC 5376.001
School of Science and Engineering
Spring 2018

A. COURSE INFORMATION

Course number/section: COSC-5376.001
Class meeting time: MW 8.00 – 8.50 AM; F Online
Class location: OCNR-133
Course Website: http://sci.tamucc.edu/~garciam

B. INSTRUCTOR INFORMATION

Instructor: Mario A Garcia
Office location: CI 331; CI 370
Office hours: M T TH F 2.45 – 4.00 PM;
Telephone: (361) 825-3478
e-mail: mario.garcia@tamucc.edu
Appointments: By email

C. COURSE DESCRIPTION

This course is a study of networking basics and security essentials with respect to
information services provided over a computer network. The course covers the technical
details of security threats, vulnerabilities, attacks, policies, and countermeasures such as
firewalls, honeypots, intrusion detection systems, and cryptographic algorithms for
confidentiality and authentication and the development of strategies to protect information
services and resources accessible on a computer network.

Course relevance. It is expected that the knowledge and practice acquired by the students will
help them to do find jobs as network administrators.

D. PREREQUISITES AND COREQUISITES

COSC 5321

Corequisites
none

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Thompson Course Technology

Optional Textbook(s) or Other References
none
F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1) The student will evaluate firewall technologies.
   a) Students will categorize firewall technologies.
   b) Students will modify and remediate firewalls.
   c) Students will contrast and justify selection of firewall technologies.
2) The student will judge the use of network monitoring and audit tools.
   a) Students will demonstrate the use of network monitoring tools.
   b) Students will diagram network topologies that are secure.
   c) Students will criticize appropriately the various network monitoring tools.
   d) Students will plan and justify the use of particular tools given a specific scenario.
3) The student will judge the security at various layers of the network.
   a) Students will describe security vulnerabilities in network operating systems.
   b) Students will distinguish between network layers.
   c) Students will plan and summarize security policies.
   d) Students will rewrite and revise security plans.
4) The student will recognize the ethical issues in networking security.
   a) Students will describe and define ethical security choices given a specific scenario.
   b) Students will defend and demonstrate ethical behavior.
   c) Students will appraise and categorize ethical methods of breaching network security.
   d) Students will discriminate between ethical and unethical behaviors.
   e) Students will compare and summarize ethical behaviors.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This class is a hybrid class with face-to-face and an online component: The class is composed of online lectures, homework, class discussion, and programming assignments. Each week the instructor will post two questions for class discussion. In order to have credit, each student has to answer the two questions. In addition, each student must read and reply to three classmates posts. All course materials will be in Blackboard. Formative assessment will consist of feedback provided by students after each lecture (summarizing the most
important concepts learned in each class and stating what concepts were not understood or were difficult). Summative evaluation will consist of a midterm exam and two research papers.

H. MAJOR COURSE REQUIREMENTS AND GRADING

The class will have formative and summative assessment.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>20</td>
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<td>Exam 2</td>
<td>20</td>
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<td>Exam 3</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td>Homework</td>
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<td>Research Paper</td>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>Week 1 Jan 16-19</td>
<td>Introduction</td>
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<tr>
<td>Week 2 Jan 22 – 26</td>
<td>Network Security Fundamentals Assets and Risk Management Chapter 1. Network Security Fundamentals</td>
<td>Quiz Chapter 1 Hands-on Chapter 1</td>
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<td>Jan 23 Last day to add a class</td>
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<td>Week 3 Jan 29-Feb 2</td>
<td>TCP/IP Security Prelude to Hack Threats, Chapter 2 TCP/IP Security</td>
<td>Quiz Chapter 2 Hands-on Chapter 2</td>
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<td>Week 4 Feb 5-9</td>
<td>Host System Hardening HostHarden.ppt</td>
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<td>Feb 7: Exam 1 Ch 1, 2 HSH</td>
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<td>Quiz Chapter 3 Hands-on Chapter 3</td>
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<td>Week 5 Feb 12-16</td>
<td>Network Traffic Signatures Chapter 3 Network Traffic Signatures</td>
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<td>Week 6 Feb 19-23</td>
<td>Routers Chapter 4 Routing Fundamentals</td>
<td>Quiz Chapter 4 Hands-on Chapter 4</td>
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| Week 7  | Feb 26-Mar 2 | Cryptography  
Feb 28: Midterm Exam  
Ch 3,4,5 | Chapter 5  
Cryptography | Quiz Chapter 5  
Hands-on  
Chapter 5 |
|--------|--------------|------------------|-----------------|------------------|
| Week 8 | Mar 5-9      | Wireless Network  
Fundamentals | Chapter 6  
Wireless  
Fundamentals | Quiz Chapter 6  
Hands-on  
Chapter 6 |
| Week 9 | Mar 12-16    | Spring Brake     |                 |                  |
| Week 10| Mar 19-23    | Wireless Security | Chapter 7  
Wireless Security | Quiz Chapter 7  
Hands-on  
Chapter 7 |
| Week 11| Mar 26-30    | Intrusion detection  
Mar 28: Exam 3  
Ch 6,7,8 | Chapter 8  
Intrusion detection | Quiz Chapter 8  
Hands-on  
Chapter 8 |
| Week 12| Apr 2-6      | Firewalls        | Chapters 9-10  
Firewalls | Quiz Chapter 9-10  
Hands-on  
Chapter 9-10 |
|        | April 6: last day to drop a class |                  |                 |                  |
| Week 13| Apr 9-13     | Virtual Private Networks VPN | Chapter 11  
VPN’s | Quiz Chapter 11  
Hands-on  
Chapter 11 |
| Week 14| Apr 16-20    | Web Security     | Chapter 12  
Web Security | Quiz Chapter 12  
Hands-on  
Chapter 12 |
| Week 15| Apr 23-27    | Research Paper due date: Apr 23  
Presentations Apr 23 - 27 |                 |                  |
| Week 16| Apr 30-May 4 | Final Exam  
May 4: 8.00 – 10.30  
Ch 9,10,11,12 |                 |                  |
|        | May 1: last day to withdraw from the University  
May 2 Last day of Class |                 |                  |
Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
Class attendance is important to succeed in this course.

Late Work and Make-up Exams
Assigned readings are assumed to be completed as scheduled. Homework, exams and Labs will be submitted using Blackboard. *Once the deadline is reached, the submission link in Blackboard will close resulting in a grade of “0”. Submissions by email to the instructor will not be considered and will not be graded.*

Extra Credit
None

Cell Phone Use
None

Laptop Use
Not allowed

Food in Class
Not allowed

Missed Exam
Makeup exams will be considered if the instructor is informed ahead of time or in cases of extreme circumstances

Participation
Class participation is essential in this course. Collaborative learning needs the participation of everybody in the class.

Others
Courtesy Expectations. Mutual respect is expected. The instructor expects full attention from the students when he is lecturing.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is
the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at
http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely
manner during regularly scheduled lecture periods.