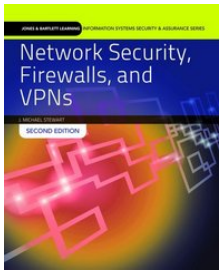
Cosumnes River College
CISS 330
Implementing Internet Security and Firewalls
A Hybrid-Online Course
Fall 2018
(Full Term)

Instructor: Buddy Spisak **Office Hours**: Wed. 7:00-8:00 p.m. (Sept. 4th to Dec. 19th)

Office: BSS-143
Voice Mail: (916) 286-3691, ext. 14162
Email: spisakj@crc.losrios.edu The turn-around time for responding to most emails is about one to two days. Be sure to include your name and the course number in each email so I can identify who you are and what the email is about.
Course Web page: https://lrccd.instructure.com
Instructor Web page: http://crc.losrios.edu/spisakj/

Prerequisites: CISS 310
Lecture: Online (20628)
Lab: Mondays 7:00 to 8:05 p.m. in BSS-153
Accepted for Credit: CSU
Class Credits: 3 units

Required Textbooks:



Title: *Network Security, Firewalls, and VPNs, 2nd Edition*
Author: J. Michael Stewart
Publishing Info: Jones & Bartlett Learning, 2014
Textbook ISBN-13: 9781284031676
E-book ISBN-13: 9781284107715

Optional Materials: A flash drive to store your work for the class

Course Description:

With the increased connectivity to the Internet and the wide availability of automated cracking tools, organizations can no longer simply rely on operating system security to protect their valuable corporate data. The firewall has emerged as a primary tool used to prevent unauthorized access. Students will learn how to allow access to key services while maintaining their organization's security as well as how to implement firewall-to-firewall Virtual Private Networks (VPNs).

Student Learning Outcomes and Course Objectives:

Upon completion of this course, the student will be able to:

- EXPLAIN THE RELATIONSHIP AMONG THE DIFFERENT ASPECTS OF INFORMATION SECURITY, ESPECIALLY NETWORK SECURITY (SLO #01).
    - Define the key terms and critical concepts of information and network security.
    - Identify the threats posed to information and network security, as well as the common attacks associated with those threats.
    - Differentiate threats to information within systems from attacks against information within systems.
- DESCRIBE THE BASIC ELEMENTS OF COMPUTER-BASED DATA COMMUNICATION (SLO #02).
    - Know the key entities and organizations behind current networking standards, as well as the purpose of and intent behind the more widely used standards.
    - Explain the nature and intent of the OSI reference model, and list and describe each of the model's seven layers.
    - Describe the nature of the Internet and the relationship between the TCP/IP protocol and the Internet.
- DEFINE MANAGEMENT'S ROLE IN THE DEVELOPMENT, MAINTENANCE, AND ENFORCEMENT OF INFORMATION SECURITY POLICY, STANDARDS, PRACTICES, PROCEDURES, AND GUIDELINES (SLO #03).
    - Describe an information security blueprint, identify its major components, and explain how it is used to support a network security program.
    - Discuss how an organization institutionalizes policies, standards, and practices using education, training, and awareness programs.
    - Explain contingency planning, and describe the relationships among incident response planning, disaster recovery planning, business continuity planning, and contingency planning.
- DISCUSS COMMON SYSTEM AND NETWORK VULNERABILITIES (SLO #04).
    - Name the common categories of vulnerabilities.
    - Locate and access sources of information about emerging vulnerabilities.
    - Identify the names and functions of the widely available scanning and analysis tools.
- IDENTIFY THE LIMITATIONS OF FIREWALLS (SLO #05).
    - Identify common misconceptions about firewalls.
    - Explain why a firewall is dependent on an effective security policy.
    - Describe the types of firewall protection.
    - Evaluate and recommend suitable hardware and software for a firewall application.
- DESCRIBE PACKETS AND PACKET FILTERING (SLO #06).
    - Explain the approaches to packet filtering.
    - Recommend specific filtering rules.
- WORK WITH PROXY SERVERS AND APPLICATION-LEVEL FIREWALLS (SLO #07).
    - Discuss proxy servers and how they work.
    - Identify the goals your organization can achieve using a proxy server.
    - Choose a proxy server and work with the SOCKS protocol.
    - Evaluate the most popular proxy-based firewall products.
    - Explain how to deploy and use reverse proxy.
    - Determine when a proxy server isn't the correct choice.
- IDENTIFY AND IMPLEMENT DIFFERENT FIREWALL CONFIGURATION STRATEGIES (SLO #08).
    - Understand the nature of advanced firewall functions.
    - Track firewall log files and follow the basic initial steps in responding to security incidents.
    - Use a remote management interface.
    - Adhere to proven security principles to help the firewall protect network resources.
    - Update a firewall to meet new needs and threats.

- DESCRIBE THE ROLE ENCRYPTION PLAYS IN A FIREWALL ARCHITECTURE (SLO #09).
    - Discuss Internet Protocol Security (IPSec) and identify its protocols and modes.
    - Analyze the workings of SSL, PGP, and other popular encryption schemes.
    - Explain how digital certificates work and why they are important security tools.
- DESCRIBE USER, CLIENT, AND SESSION AUTHENTICATION (SLO #10).
    - Explain why authentication is a critical aspect of network security.
    - Explain why firewalls authenticate and how they identify users.
    - List the advantages and disadvantages of popular centralized authentication systems.
    - Discuss the potential weaknesses of password security systems.
    - Discuss the use of password security tools.
    - Describe common authentication protocols used by firewalls.
- RECOMMEND BEST PRACTICES FOR EFFECTIVE CONFIGURATION AND MAINTENANCE OF VIRTUAL PRIVATE NETWORKS (SLO #11).
    - Explain the components and essential operations of virtual private networks (VPNs).
    - Enable secure remote access for individual users via a VPN.
    - Create VPN setups, such as mesh or hub-and-spoke configurations.

Methods of Measuring Student Learning Outcomes:

- You will demonstrate knowledge of network and Internet security applications and standards through class discussions and achievement on quizzes and final examination.
- You will demonstrate competence in the coursework by completing lab work and participating in Canvas discussions during the semester.

Student Obligations:

- **Attendance**: This is a hybrid course. It's up to you to go to the course materials in Canvas and do all the required work. Please note that failure to complete 10% of the total course work by the third week of the class may result in your being dropped from the course.
- **Late Work**: Unless noted, all assignments are due on Sunday by midnight each week. Late work will be accepted ONLY if you have contacted me prior to the due date either by email or voice mail. In general, late work is due the next week, and no late assignments may be turned in after one week from the original due date regardless of the reason. For every day an assignment is late, you will lose 10% of its grade.
- **Due Dates**: Unless noted, all assignments will be submitted in Canvas. If, for any reason, you cannot access Canvas or are unable to submit the assignment on time, please email it to me instead so that you are not penalized for being late. Quizzes and the discussion items cannot be taken past their due dates. If you miss a quiz and you want to make up points, you can take advantage of the extra credit assignments posted in Canvas. Everyone is welcome to work on the extra credit assignments. Typically, they are five to ten points each, depending on the difficulty of the assignment.
- **Labs**: There will be nine labs credited for homework for the class. The labs will consist of a combination of end-of-chapter review questions, case studies, and activities. The due dates are in the **SCHEDULE** portion of this handout. We will spend a lot of time working on lab activities. Each lab has a set of review questions that you will need to answer in Canvas to receive points for that assignment.
- **Discussions**: I want everyone to take a pro-active approach to learning this material. This includes using the Discussions link to ask questions and answer other students' questions. I will also post questions each week that you can answer use to further your understanding of the material. I expect two postings each week unless otherwise noted.
- **Final Exam**: The final exam will consist of two parts. One part of the exam will be a hands-on practical demonstration of assigned tasks, and the other part will be an exam taken in Canvas.
- **Plagiarism Policy**: It is inappropriate, and a violation of academic policy, to copy information from any source (including, but not limited to, textbooks, magazine articles, newspaper articles and Internet articles) without giving proper credit to the author by using standard quotation

procedures such as in-line quotes, footnotes, endnotes, etc. Quotes may not exceed 25% of the assignment's total length. You will receive no credit (0 points) for any assignment that copies any material from any other source without giving proper credit to the author(s). Repeat offenders of this policy are subject to academic discipline as outlined in the policies published by the college.

- **Cheating**: Students who cheat will receive a failing grade for the course. See the Students Rights and Responsibilities page of the college website (https://www.crc.losrios.edu/catalog/geninfo/rights) for additional information.
- **CRC Honor Code:** Academic integrity requires honesty, fairness, respect and responsibility. See the Cosumnes River College Honor Code posted on the college website (http://www.crc.losrios.edu/files/resourceguide/CRC-HonorCodeForm.pdf).
- **Email**: Every student will be required to have an email account. If you do not have an email account, the college provides free email accounts for all current students. To activate your account, go to www.losrios.edu/lrc/lrc_email.php and follow the directions provided.
- **Email etiquette**: I will not tolerate rude and demeaning comments or e-mails to anyone in this class. Please keep your comments and e-mails topic-related. If I determine that a comment or e-mail to anyone else in the class is rude or demeaning, I will warn you once. If your behavior continues to be unacceptable, I will refer you to the administration of the college for disciplinary action.
- **Disabilities:** If you have a documented disability and wish to discuss academic accommodations, please contact me after class or contact the Office of Disabled Student Programs and Services at 691-7275 as soon as possible.
- Campus Police: You can call 558-2221 to request a safety escort.
- **Canvas:** This class utilizes a product called "Canvas." It is highly recommended that you check the website frequently for scheduling updates and homework assignments. Most of the homework assignments and quizzes will be done on Canvas.
- **Online Course Responsibilities:** This course requires significant self-motivation. You must not get behind. Labs and weekly assignments can take up to eight hours to finish. Please don't try to finish them in one day. Not all activities are created equal. Some may take a bit longer than others. You would normally spend 3 hours per week in class for this course: total of 54 hours. Allow yourself at least 8 hours per week to complete the activities online, including the time spent writing for the postings to the discussions page. You should plan additional time to read the textbook and study for the quizzes. Some people believe this is a much easier way to study this subject than an on-campus framework because they love to read and avoid the parking problems. Others feel very intimidated at first. Be patient as you work your way through the activities.

Grading:

Course Topic		Points	Total	Approximate % the of Grade
Labs (9)		50	450	49
Orientation Quiz (1)		10	10	1
Quizzes (4)		30	120	13
Discussions (7)		20	140	15
Final Lab Activity (1)		50	50	5
Final Exam (1)		150	150	17

Point System: There are 920 total assigned points.

Grade Ranges: A= 828-920, B=736-827, C=644-735, D=552-643, F=0-551

Schedule: It is tentative and can change during the term. All changes will be located under the "Announcement" section in Canvas for the course.

	Day:		Lecture/Lab Schedule:	Assignment Due:	Due Date (By Midnight):
Week 1	Mon.	(8/27)	Orientation and Introductions Ch 1: Network Security Fundamentals	View the Online Orientation Orientation Disc. Orientation Quiz	Sun., 9/2
Week 2			**Labor Day Holiday** **No class meeting Sept. 3**		
Week 3	Mon.	(9/10)	Ch 2: Firewall Fundamentals Lab #1	Disc. #1	Sun., 9/16
Week 4	Mon.	(9/17)	Ch 3: VPN Fundamentals Lab #2	Lab Review #1	Sun., 9/23
Week 5	Mon.	(9/24)	Ch 4: Network Security Threats and Issues	Disc. #2 Lab Review #2 Quiz#1 (Ch 1-3)	Sun., 9/30
Week 6	Mon.	(10/1)	Ch 5: Network Security Implementation Lab #3		Sun., 10/7
Week 7	Mon.	(10/8)	Ch 6: Network Security Management Lab #4 - The Endian Firewall	Disc. #3 Lab Review #3	Sun., 10/14
Week 8	Mon.	(10/15)	Ch 7: Exploring the Depths of Firewalls	Lab Review #4 Quiz#2 (Ch 4-6)	Sun., 10/21
Week 9	Mon.	(10/22)	Ch 8: Firewall Deployment Considerations Lab #5 - The Check Point Firewall	Disc. #4	Sun., 10/28
Week 10	Mon.	(10/29)	Ch 9: Firewall Management and Security Concerns Lab #6	Lab Review #5	Sun., 11/4
Week 11	Mon.	(11/5)	Ch 10: Using Common Firewalls Lab #7	Disc. #5 Lab Review #6 Quiz#3 (Ch 7-9)	Sun., 11/11
Week 12			**Veterans Day Holiday** **No class meeting Nov. 12**		
Week 13	Mon.	(11/19)	Ch 11: VPN Management Lab #8	Lab Review #7	Sun., 11/25
Week 14	Mon.	(11/26)	Ch 12: VPN Technologies Lab #8	Disc. #6 Lab Review #8	Sun., 12/2
Week 15	Mon.	(12/3)	Ch 13: Firewall Implementation: A Thorough Case Study	Quiz#4 (Ch 10-12)	Sun., 12/9
Week 16	Mon.	(12/10)	Ch 14: VPN Implementation: A Thorough Case Study Lab #9 - The Vyatta Firewall Final Review	Disc. #7 Lab Review #9	Sun., 12/16
Week 17	Mon.	(12/17)	Final Exam will be on campus (required) in BSS-153		All work needs to be turned in.