Reedley College

Spring 2020
January 13, 2020 – May 22, 2020

Course Information

IS-81-56171 – Computer Network+ and Security+ Training

Meetings Dates and Times

Monday through Thursday, 12:00 pm – 1:50 pm – Lecture (PHS 352)
Monday through Thursday, 2:00 pm – 3:50 pm – Lab (PHS 352)
Except: *January 20 (MLK, jr. Day), February 17 (Washington's Birthday), April 6-9 (Spring Break). Finals week may vary.*

Class Cancellation

In the event that class is cancelled unexpectedly, an announcement will be sent out via Canvas and Remind. Additional means, such as via email may also be employed.

Textbooks

West, J., Dean, T., and Andrews, J. *Network+ Guide to Networks*. 8th ed. Cengage Learning, 2020. ISBN: 978-1-337-56933-0.

Ciampa, M. *CompTIA Security+ Guide to Network Security Fundamentals.* 6th ed. Cengage Learning. ISBN: 978-1-337-28878-1.

Required Materials

A basic, low-cost networking kit is required for this course. This is available in the bookstore, and your instructor will have details on this tool kit in class.

Instructor Information

Jason Boyer, MBA
     jason.boyer@reedleycollege.edu
     (559) 638-0300 ext. 3410

Contact Information

Preferred Contact

Use the Canvas Inbox Tool to email questions about assignments and course content. As a backup, or for other questions, contact the appropriate instructors using the above contact information.

Office Hours

I am available for in-person contact in BUS 47 or PHS 352, during office hours as posted outside BUS 47. I will also meet with you at mutually agreed upon times. Please email me to set up an appointment.

Course Description

This course introduces the fundamental building blocks that form a modern network such as protocols, topologies, hardware, network architectures and network operating systems. The course will also cover the most important concepts in contemporary networking and security which include TCP/IP, Ethernet, wireless transmission, network administration, intrusion detection systems, support and troubleshooting WANs (Wide Area Networks). Students will develop the skills to implement a secure network topology using the proper hardware and software for their environment. Students will build a network from scratch and maintain, upgrade, and troubleshoot an existing network. Finally, students will be prepared to take the CompTIA (The Computing Technology Industry Association) Network + and Security + certification exams.

Prerequisites, co-requisites, and advisories

PREREQUISITES: Information Systems 80. Waived by mutual agreement with the instructor, based on academic and professional knowledge and experience.

ADVISORIES: None

Course Learning Objectives

1. Configure the proper addressing technologies, including subnetting, and public and private addressing schemas.
2. Differentiate between IPv4 and IPv6 routing protocols types, including link state, distance vector, and hybrid.
3. Install and properly terminate various cable types and connectors using appropriate tools.
4. Identify and explain common physical, logical and network topologies, including: star, mesh, peer to peer, and client/server.
5. Differentiate between the most common networking devices, including NIC (Network Interface Card), basic switch, bridge, and wireless AP (Access Point).
6. Explain the functions of specialized network devices, including multilayer switch, and bandwidth controller.
7. Discuss the function of each layer of the OSI (Open Systems Interconnection) model.
8. Recognize the different network monitoring tools that affect network performance, optimization and security.
9. Apply the command line interface by using commands such as traceroute and nslookup and interpret the output to verify network functionality.
10. Implement hardware and software security devices, including a network-based firewall, and a host-based firewall.
11. Define issues that affect network and device security including physical security and restrictions on local and remote access with the consideration of threats such as Denial of Service attacks (DoS), viruses, and worms.
12. Compare and contrast technologies that support cloud and virtualization.
13. Given a set of requirements, implement a basic computer network including the features to secure it.

Student Learning Outcomes

1. Given a scenario, design a network topology using the open systems interconnection (OSI) 7-layer model, while considering: scalability, projected growth, and available resources. The topology should also consider the fundamental goal of Cyber Security – Confidentiality, Integrity, and Availability (CIA) of data which is transmitted on a given network and governed by federal and state regulations and procedures.
2. Configure network hardware and software to create e-mail, file, and other useful servers, in both Windows and Linux platforms.
3. Design and configure an Intrusion Detection System (IDS) for a medium to large enterprise, while using the most common tools and documentation used by Cyber Security experts to perform network sniffing, monitoring, surveillance, and enumeration of data.

Learning Methods

- Lecture
- Lab
- Demonstrations
- Guided practice
- Other learning methods as determined necessary by the instructor.

Attendance

You will be dropped from the course under the following circumstances:

1. If you do not attend the first day of class.
2. If you miss more than two combined weeks in the first half of the semester.

For every day you are present and participate, points will be awarded to a final participation grade.

Be on time! I will lock the door after attendance is taken.

Readings, Assignments, Hands on Projects, and Exams

Academic Honesty

Assignments and Projects
Students are required to complete assignments and hands-on projects on their own. In other words, <u>unless otherwise specified</u>, you may <u>and are encouraged</u> to collaborate with fellow students except on individual exams and assignments as specified.

Examinations
All examinations must be completed individually. Collaborative work <u>will not</u> be allowed during examinations. The use of books, notes, cell phones, and other electronic devices will not be allowed during examinations, unless specifically stated by the instructor prior to the examination.

Late Work Policy
Late work will not be accepted. If a student fails to submit an assignment or project on the day that it is due, then the student will lose points for that project. No excuses will be accepted. To summarize:

- No late work accepted!
- Absolutely no excuses will be accepted!

Make-up examinations are only granted with advanced notification for extenuating circumstances.

Due Dates

You will find all work that is due organized into modules (folders) in Canvas.

Required reading is expected to be completed prior to the next class lecture. Therefore, it is recommended that you complete weekly reading assignments early. <u>Due dates and times will be posted on Canvas.</u>

Outcomes Assessment

Below is an outline of assessments and point values assigned. Use this for determining your final grades.

Understand that this is approximate, and total points values may change slightly as assignments change as needed at the instructor's discretion.

Assessments	Percentage of Grade
Participation and Professionalism	10%
Homework	20%
Quizzes	15%
Labs	10%
Hands On Examinations	25%
Midterm and Final (Written)	20%

Table 1 - Outcomes Assessments

The grading scale is: 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, <60%=F

Drop Dates

- Friday, January 24, for a refund
- Friday, January 31, to avoid a "W" (in person)
- Sunday, February 2, to avoid a "W" (on Web Advisor)
- Friday, March 13, to avoid a "Letter Grade"

It is each student's responsibility to drop the class if they are no longer attending or no longer interested, otherwise they risk obtaining a grade of "F" in the class.

Policies

Expectations

There are three expectations of students in this class. These expectations can be applied anywhere in your educational journey as well as in your career and will serve you well.

1. **Be where you need to be, when you need to be there.**

You may have heard it said the "early is on-time; on-time is late." Punctuality and dependability is one of the most sought after qualities in employees. Showing up is important, but also, be present. Stay focused, on-task, and pay attention to whatever you are doing. If you are not present, you are not participating, and you will lose participation points.
In class, this looks like:

- Being in your seat, ready to work at the beginning of class. If you are not present and seated when attendance is taken, you will be marked absent.
- Staying on task and <u>mentally present</u> in the class. Work only on in-class assignments. Work for other classes and personal business needs to be handled elsewhere.
- Cell phones and other personal electronic devices, as well as social media are a distraction and unless otherwise specifically authorized, are not allowed.
- Instructors reserve the right to lock the door once class begins.

2. **Dress for success.**
What you wear reflects who you are. It is not just being properly attired, but the attitude you wear too. Be respectful and professional always. Failing to maintain a proper attitude can be a distraction and could lead to discipline if it becomes a distraction to others.
In class, this looks like:

- Wearing shoes or sandals and appropriate attire at all times on campus, per SCCCD and Reedley College rules.
- Conduct yourself in a manner that reflects how you want to be seen by others.
- Maintaining a positive and pleasant learning environment.

3. **Know and Do the Right Thing.**
Knowing what is right only has meaning if you do what is right. In the classroom, respect between classmates, respect for the school and school property, as well as respect between instructor and students is the key to a positive learning environment. Failing to respect each other will result in disciplinary consequences, from loss of participation points up to and including suspension and expulsion per State Center Community College policy.
In class, this looks like:

- Being respectful in all interactions with others, tolerant of different points of view and backgrounds, and using language that is respectful to others.
- Eating and drinking OUTSIDE the classroom and computer labs.
- Turning cell phone ringers off and remaining off the devices during lecture.
- Keeping distractions out of the classroom: visitors are not allowed unless arrangements are made prior to the start of class.
- Leaving the classroom and lab cleaner than you found it.

Personal and Academic Conduct
A student will be subject to discipline if she or he:

- Prevents other students from pursuing their authorized curricular or co-curricular interests.
- Interferes with or disputes faculty and administrators who are fulfilling their professional responsibilities.
- Prevents classified employees from fulfilling their prescribed duties.
- Deliberately endangers the safety of persons or the security of college property.
- Violates Reedley College computers and networks usage policy.

- Violates Reedley College cheating/plagiarism policy.

Accommodations

If you have a verified need for an academic accommodation or materials in alternate media (i.e. Braille, large print, electronic text, etc.) per the Americans with Disabilities Act or Section 504 of the Rehabilitation Act, please contact your instructors as soon as possible.

Cheating

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner such as having improper access to answers, attempting to gain an unearned academic advantage.

Cheating may include but is not limited to:
- Copying from another's work
- Supplying one's work to another
- Giving or receiving copies of examinations without an instructor's permission
- Using or displaying notes or devices inappropriate to the conditions of the examination
- Allowing someone other than the officially enrolled student to represent the student
- Failing to disclose research results completely.

Incidents of cheating may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, assignment, or hands-on project in question to a failing grade in the course, at the discretion of the instructor and depending on severity and frequency.

Class Schedule

Note: This schedule is subject to change to meet the needs of the class.

Week	Week of	Topic	Reading Assignments/Major Assessments
1	1/13/2020	• Introduction to Networking • Network Infrastructure and Documentation	• Network+ Chapter 1 • Network+ Chapter 2
2	1/20/2020	• Network Addressing, Protocols and Routing	• Network+ Chapter 3 • Network+ Chapter 4
3	1/27/2020	• Network Cabling	• Network+ Chapter 5
4	2/3/2020	• Wireless Networking • Virtualization and Cloud Computing	• Network+ Chapter 6 • Network+ Chapter7
5	2/10/2020	• Subnets and VLANs	• Network+ Chapter 8
6	2/17/2020	• Network Risk Management	• Network+ Chapter 9
7	2/24/2020	• Security in Network Design	• Network+ Chapter 10
8	3/2/2020	• Network Performance and Recovery • WANs	• Network+ Chapter 11 • Network+ Chapter 12
9	3/9/2020	• **Midterm (Networking)** • Intro to Security	• **Midterm (Networking)** • Security+ Chapter 1
10	3/16/2020	• Malware and Social Engineering Attacks	• Security+ Chapter 2
11	3/23/2020	• Cryptography	• Security+ Chapter 3 • Security+ Chapter 4
12	3/30/2020	• Networking and Server Attacks	• Security+ Chapter 5
	4/6/2020	**Spring Break**	
13	4/13/2020	• Network Security Devices, Design, and Technology	• Security+ Chapter 6
14	4/20/2020	• Administering a Secure Network • Wireless Network Security	• Security+ Chapter 7 • Security+ Chapter 8
15	4/27/2020	• Host, Application, and Data Security • Mobile Security	• Security+ Chapter 9 • Security+ Chapter 10
16	5/4/2020	• Authentication and Account Management • Access Management	• Security+ Chapter 11 • Security+ Chapter 12
17	5/11/2020	• Vulnerability Assessment and Data Security • Business Continuity • Risk mitigation	• Security+ Chapter 13 • Security+ Chapter 14 • Security+ Chapter 15
18	5/18/2020	• **Final (Security)**	• **Final (Security)**