Reedley College

Spring 2016

1/11/16 – 3/11/16

## Course: **IS 64 51340 - Networking II**

## Class meets: TTH 2 pm – 5:50 pm

Instructor: David L. Atencio, BA computer science/MBA

Email: [david.atencio@reedleycollege.edu](mailto:david.atencio@reedleycollege.edu)

Phone: 638-3641 ext 3410

Office Hours: TBD

Final Drop Date: 2/11

**Text Books and Study Material:**

Network+ Guide to Networking

Network+ Guide to Networking Lab book

1. **Course Description and Information:**

This course covers advanced concepts in networking software and hardware. Installation of WAN hardware components and software will be examined. Installation of communications/internet software, proxy servers, transaction servers, domain name servers, and mail servers will be examined in a virtual environment. Design and implementation techniques for large organizations are also covered.

1. **Course Learning Objectives and Outcomes:**

**Objectives:**

* Be able to explain the function of each layer of the OSI (Open Systems Interconnection) model
* Draw each key network topology design, and identify their advantages and disadvantages
* Use network configuration management documentation to operate a typical server
* Design, and configure mail, and web servers
* Given a scenario, evaluate the network based on configuration management documentation
* Know the difference between wiring schematics and network diagrams - for both physical and logical networks
* Have the skills to determine baselines, policies procedures, and configurations for infrastructure and network devices
* Have experience in configuring web server software, as well as installing and configuring web extensions and FTP, manage user rights and permissions for web folders
* Know how to install proxy and domain name servers, and perform basic maintenance and configuration

**Outcomes:**

1. Design, install, configure and document a network topology for a typical small business. Topology selection to consider: scalability, security needs, projected growth, available resources, and within the confines of the open systems interconnection (OSI) 7 layer model.
2. Conduct network monitoring tools such as sniffers to identify performance and connectivity issues
3. Given a scenario, implement the following network troubleshooting methodology

* Information gathering - identify symptoms and problems
* Identify the affected areas of the network
* Determine if anything has changed
* Establish the most probable cause
* Determine if escalation is necessary
* Create an action plan and solution identifying potential effects
* Implement and test the solution
* Identify the results and effects of the solution
* Document the solution and the entire process

1. Configure server and monitoring software to observe good network management by troubleshooting connectivity issues and strive for convergence: to include traffic management/shaping, identifying correct server/client ports, and optimizing hardware to improve network throughput.
2. Operate various server configurations in a virtual environment, using popular virtualization software
3. **Attendance:** Attendance is required and the instructor reserves the right to take roll at any time during the duration of the class period. To achieve successful completion of the course, it is critical for the students taking this course to attend all classes. I will drop you if you have more than three consecutive unexcused, absences.
4. **Policies:** Campus code requires that shoes or sandals and appropriate attire be worn at all times on Eating, drinking, and smoking is not allowed in the classroom or computer labs. Cell phone must be turned off or in the silence mode while class is in session. 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.

1. **Behavioral Standards:** Your classmates and I would greatly appreciate that students in the class take care of any personal needs (i.e., using the rest room, getting a drink, sharpening a pencil) before class begins. Please turn off you cell phones when entering the class. You may not use your phone as a calculator. I would appreciate that you not bring guests to class. I start class on time, please don’t be late. If you are late, it is your responsibility to ensure you are counted for attendance after class. You may not surf the internet during lectures.
2. **Academic Dishonesty:** Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly obtained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.

* **Plagiarism:** Plagiarism is the adoption or reproduction of the ideas or words or statements of another person without due acknowledgment. This can range from borrowing without [attribution](http://en.wikipedia.org/wiki/Attribution) a particularly apt phrase, to paraphrasing someone else's original idea without citation, to wholesale [contract cheating](http://en.wikipedia.org/wiki/Contract_cheating). When plagiarizing, students will often turn to the [Internet](http://en.wikipedia.org/wiki/Internet), due the ease of [copying and pasting](http://en.wikipedia.org/wiki/Copying_and_pasting) from websites. Other more old fashioned forms of plagiarism such as [paper mills](http://en.wikipedia.org/wiki/Essay_mill) and passing off obscure articles or chapters of books of others as original work also still occur. Plagiarized papers are often riddled with gross inconsistencies such as referencing non-existent sections of the essay, changes in spelling and grammar customs, or the argument changing in mid-paragraph.
* **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 in an attempt to gain an unearned academic advantage. Cheating can take the form of [crib notes](http://en.wikipedia.org/wiki/Cheat_sheet), looking over someone's shoulder during an exam, or any forbidden sharing of information between students regarding an exam or exercise. Also, the storing of information in graphing calculators, pagers, cell phones, and other electronic devices has cropped up since the information revolution began. Incidents of cheating and plagiarism may result in a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course at the discretion of the instructor and depending upon the severity and frequency of the incidents.

1. **Accommodations for students with disabilities**: 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 (ADA) or Section 504 of the Rehabilitation Act please contact me as soon as possible.
2. **Learning Methods:**
   1. Lectures – used to provide bring all students to a level playing field of learning
   2. Required reading
   3. Class projects and Blackboard assignments (lab work)
   4. Textbook assignments (lab work)
3. **Reading and Lab Assignments:**  Assigned chapters MUST be read prior to attending class. Students are required to complete class/lab assignments in class. You may collaborate with fellow students on lab assignments. Late lab assignments will not be accepted.
4. **Outcomes assessment:**

*Network+ Guide to Networks:* Quizzes (2 @ 20 points each) 40 points

Labs (15 @ 10 points each) 150 points

Midterm 50 Points

Participation 100 points

Final Exam/demonstration 100 points

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Total 430 points

Grading scale:

90-100% = A 80-89% = B 70-79% = C 60-69% = D <60% = F

1. **Final Drop Date:** The final drop date for this class is: 2/11/15 (to avoid a “W”)
2. **Examinations and assignments:** All examinations must be completed individually. Students may make use of the help feature of any application provided in the classroom computers. Students may use their books and notes for all examinations. I will keep open the previous week, current week and one future week at all times for assignments and exams. Once a week is closed out it will be too late to make up.
3. **Schedule:**

**(Note\*\*\*\* I reserve the right to change any or all of the schedule according to the needs of the class)**

| **Week** | **Other Assignments** | **Reading Assignments** | **Homework/Lab Assignments** |
| --- | --- | --- | --- |
| ***Week 1*** |  | Read:  Chapter 1  Chapter 2  Lecture:  A Re- Introduction to Networking  The OSI model | **Class orientation, Intro to Blackboard, syllabus review, district policies, companion website. Introduction to networking.**   1. **Assessment 1-20** 2. **Lab 1 - (2.1, 2.2)** |
| ***Week 2*** | [**Assessment**](http://www.proprofs.com/certification/comptia/network-plus/practice/index.shtml) | Watch:  RouterGods Subnetting Tricks Part 1 and 2 | 1. **Assessment 21-40** 2. **Sub-netting practice quiz** 3. **Lab 2: Sub-netting Class “C” and “B” addresses** 4. **Quiz 1** |
| ***Week 3*** | **NAT**  [**Assessment**](http://www.proprofs.com/certification/comptia/network-plus/practice/index.shtml)  [**Anatomy of NAT**](http://www.cisco.com/web/about/ac123/ac147/archived_issues/ipj_7-3/anatomy.html)  [How NAT works](http://technet.microsoft.com/en-us/library/cc756722(WS.10).aspx#w2k3tr_nat_how_nsfs) | Reading/Lecture:   1. Chapter 4 2. Chapter 5 3. How NAT Works 4. Anatomy of NAT 5. Topologies | 1. **Assessment 41-60** 2. **Sub-netting practice quiz** 3. **Lab 3 - (project 4-1 - 4-3)** 4. **Lab 4 – (project 5-3)** |
| ***Week 4*** | [**Server Roles and technologies**](https://technet.microsoft.com/en-us/library/cc753940(WS.10).aspx) | Reading/Lecture:   1. Chapter 6 Network Hardware 2. Chapter 9 Network Operating Systems 3. Server roles and technologies | 1. **Assessment 61-80** 2. **Sub-netting practice quiz** 3. **Lab 5 - (6.1, 6.2, 6.3)** 4. **Quiz 2** |
| ***Week 5*** |  | Chapter 9  Network Operating Systems  Ubuntu | 1. **Lab 6 - (9.1)** 2. **Lab 7- ( Project 10.1, and 10.2)** 3. **Lab 8: Install LAMP** |
| ***Week 6*** | MAN Pages  Install and configure Ubuntu web server software.  [**Install proxy server**](https://technet.microsoft.com/en-us/library/dn383662.aspx)  [Ubuntu email server](https://help.ubuntu.com/community/MailServer) | Read:   1. Chapter 13 Troubleshooting Network problems 2. install proxy servers 3. Ubuntu email servers | 1. **Lab 9: Install LAMP cont…** 2. **Lab 10: Install DNS, mail server - Ubuntu** 3. **Lab 11 - Create a proxy server with Ubuntu, and (lab13.1, 13.2, 13.3** 4. **Midterm** |
| ***Week 7*** | Make connections between Local Area Networks (LANs).  Install and configure web extensions and FTP.  [Open IIS Manager](http://technet.microsoft.com/en-us/library/cc770472(WS.10).aspx)  [Create Website](http://technet.microsoft.com/en-us/library/cc772350(WS.10).aspx) | Read:   1. [Test Lab Guide: Base Configuration](https://technet.microsoft.com/en-us/library/gg314535(v=ws.10).aspx) | 1. **Lab 12: TLG: base configuration, install IIS web server and FTP extension, etc...** 2. **Test TLG** |
| ***Week 8*** | [Firewalls](https://technet.microsoft.com/en-us/library/cc700820.aspx)  [RRAS as VPN and NAT Router](https://technet.microsoft.com/en-us/library/dd458971(WS.10).aspx) | Read:   1. Chapter 12 - Network Security 2. Firewalls 3. RRAS as VPN and NAT Router. | 1. **Lab 13: (11.2) Installing an SP Proxy** 2. **Lab: 14 (12.1) and Project 12.2** |
| ***Week 9*** | **Encryption** | Chapter 14  Ensuring Integrity and Availability  Chapter 15  Network management:  Remote management  Monitoring | 1. **Lab 15 - (14.1 and 14.2)** 2. **Final** |
|  |  | Guest Speaker  https://help.ubuntu.com/  [VLAN support in Hyper-V](http://www.virtualizationadmin.com/articles-tutorials/microsoft-hyper-v-articles/networking/introduction-vlan.html)  [Configuring Virtual Networks](http://technet.microsoft.com/en-us/library/cc816585(WS.10).aspx)  [Setup VPN](http://social.technet.microsoft.com/wiki/contents/articles/test-lab-guide-demonstrate-remote-access-vpns.aspx)  [Challenging stuff](http://technet.microsoft.com/en-us/network/bb545442)  VPNs |  |

Other resources:

Windows terminal commands:

<http://technet.microsoft.com/en-us/library/bb491013.aspx>

<http://technet.microsoft.com/en-us/library/cc771275(WS.10).aspx>

Sockets:

http://msdn.microsoft.com/en-us/library/1w48w47c.aspx#Y0