George Mason University - School of Management

MIS 320, Sections 1 & 2 - Fall 2012

Networking & Security

Revised 8/9/2012 9:00 PM EST

- Instructor: Dr. Charles "Chuck" Lynch
- Office: Enterprise Hall
- Phone: TBD
- E-Mail: clynch1@gmu.edu
- Do not expect responses to emails sent over a weekend

- Course: MIS 320, Networks & Security
  - Section: 001
    - Classroom: Robinson B201
    - Class Time: Thursday (7:20 PM - 10:00 PM)
  - Section: 002
    - Classroom: Robinson A123
    - Class Time: Monday (7:20 PM - 10:00 PM)

Description

- Introduces students to fundamentals of networking technologies and their role in businesses. Emphasis is on understanding the business implications of different networking technologies and solutions. Students learn to identify and understand the business requirements, and bring together the different technological components to design the required communication solutions. Also focuses on the types of security threats to the business network infrastructure, and approach to tackling such threats through business practices combined with appropriate technological solutions.
Networks have become the key component of any organization’s infrastructure. They are not just used for linking organization’s information systems but have become the central platform for all communications—be it data or voice. In this context, it is necessary for MIS professionals to learn appropriate methodologies that allow them to better analyze the business requirements, conduct analysis of the existing networks, and also be able to understand the design and performance of alternative network architectures. In this course, we will examine the fundamental principles that guide the architecture of computer networks. Further, as business networks expand to allow integration with other business partners and customers, they also become vulnerable to security lapses. Therefore, integral to understanding computer networks is the understanding of security implications. We will discuss several mechanisms that are used to secure large corporate networks.

**Objectives**

- Introduce the basic terminologies and concepts associated with computer networks.
- Examine the hardware and software components that make up a network.
- Introduce key architectural principles in computer networking.
- Discuss how to secure corporate networks.

**Required Textbook**

# Course Outline, Assignments, Schedule, and Due Dates

<table>
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<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Readings/ Deliverables</th>
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</table>
| 1    | (2) August 27  
   (1) August 30  
   7:20 PM - 10:00 PM | Course Administration  
   Course Overview and Assignment Discussion  
   **UNIT I: NETWORKING**  
   Telecommunications & Networking Fundamentals | Lecture                                    |
| 2    | (2) September 3  
   (1) September 6  
   7:20 PM - 10:00 PM | Communication Frequencies, Media Encoding, Multiplexing, Modulating  
   Circuit & Packet Switched Networks | Lecture  
   Quiz #1                                    |
| 3    | (2) September 10  
   (1) September 13  
   7:20 PM - 10:00 PM | **UNIT II: LOCAL AREA NETWORKS (LAN)**  
   LAN Technologies & Architectures  
   - The OSI Model  
   - Protocols  
   Chapter 1, Sections (1.2.2, 1.3.1-1.3.3, 1.3.5, 1.4.1, 1.4.3)  
   Chapter 2, Sections (2.5)  
   Homework #1 (Network Jobs) Due | Chapter 2, Sections (2.2 - 2.4)  
   Chapter 4, Sections (4.3 - 4.4.1, 4.8)  
   Quiz #2                                    |
| 4    | (2) September 17  
   (1) September 20  
   7:20 PM - 10:00 PM | LAN Design Fundamentals  
   - Ethernet  
   - Design & Build Fundamentals (Micro-Segmentation) | Chapter 2, Sections (2.6)  
   Homework #2 Due                             |
| 5    | (2) September 24  
   (1) September 27  
   7:20 PM - 10:00 PM | **UNIT III: WIDE AREA NETWORKS (WAN)**  
   Wide Area Networks (WAN)  
   - Technologies  
   - OSI Model  
   - Client/Server | Chapter 5, Sections (Review 5.2, 5.3)  
   Chapter 6, Sections (6.2)  
   Homework #2 Due                             |
| 6    | (2) October 1  
   (1) October 4  
   7:20 PM - 10:00 PM | WANs  
   - TCP/IP Basics  
   - Client/Server Fundamentals (TCP, Ports, Sockets) | Chapter 5, Sections (5.6.1, 5.6.2, 5.6.4 - 5.6.8)  
   Chapter 6, Sections (6.4, 6.5)  
   Quiz #3                                    |
| 7    | (2) October 9 (Tuesday)  
   (1) October 11  
   7:20 PM - 10:00 PM | **MID-TERM EXAM** | Starts Promptly @ 7:30 PM                  |
| 8    | (2) October 15  
   (1) October 18  
   7:20 PM - 10:00 PM | **UNIT IV: THE INTERNET**  
   - Internet History  
   - "Routing" Protocols  
   - "Routed Protocols"  
   - Design Principles | Chapter 5, Sections (5.2, 5.3, 5.6)                                    |
| 9    | (2) October 22  
   (1) October 25  
   7:20 PM - 10:00 PM | The Internet  
   - Internet Applications  
   - Services & Control (DNS)  
   - Core, Distribution, Edge Architectures | Chapter 7, Sections (7.1, 7.3.1, 7.4.1, 7.4.2)  
   Quiz #4                                    |
| 10   | (2) October 29  
   (1) November 1  
   7:20 PM - 10:00 PM | **UNIT V: ADVANCED CONCEPTS**  
   IPv6 | Chapter 5, Section (5.6.3)                                    |
| 11   | (2) November 5  
   (1) November 8  
   7:20 PM - 10:00 PM | Wireless Technology  
   - A/B/G/N  
   - Wireless Design  
   - Long-Term Evolution (LTE) & 4G> | Chapter 4, Sections (4.4, 4.5)  
   Quiz #5                                    
   Homework #3 Due                             |
| 12   | (2) November 12  
   (1) November 15  
   7:20 PM - 10:00 PM | **UNIT VI: SECURITY**  
   Security Threats  
   - Threat Vectors (The Environment)  
   - DoS, Viruses, Malware, Spyware  
   - Hacks & Warez | Chapter 8, Section (8.9.1, 8.10)  
   Quiz #6 (Wireless Technology)              |
| 13   | SPRING BREAK | Security Protection Strategies  
   - Netorking  
   - Monitoring, Firewalling, Filtering, Encryption  
   - Desktop Protection | Chapter 8, Sections (8.1.1, 8.6, 8.9.3)  
   Quiz #7 (Security Threats)  
   Homework #4 Due                             |
| 14   | (2) December 3  
   (1) December 6  
   7:20 PM - 10:00 PM | **FINAL EXAM (T/F, MC, Short Essay)** | In Class (Starts Promptly @ 7:30PM)            |
Document Downloads

PDF documents on various network and security topics will be available in "Course Documents" on Blackboard.

Grade Evaluation Elements

- 20% - Quizes
- 20% - Homework
- 25% - Mid-Term Exam
- 30% - Final Exam
- 5% - Class Participation

Grade Scale

<table>
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<tr>
<th>Final Total Points</th>
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<tr>
<td>&gt; 90%</td>
<td>A-/A</td>
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<tr>
<td>80% to &lt; 90%</td>
<td>B-/B/B+</td>
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<td>70% to &lt; 80%</td>
<td>C-/C/C+</td>
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<td>60% to &lt; 70%</td>
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<td>&lt; 60%</td>
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- Split between +/- scores will be determined by the instructor based on clustering of scores.

Exams

- Each exam will cover approximately one half of the course material (i.e., the second exam will not be cumulative) and will include materials covered in lectures, textbook, and other required readings.
- Exams will be closed book and closed notes.
- Exams may consist of multiple choice, true/false, and essay questions.
- Barring extenuating circumstances no exceptions will be made for absence from exams/quizzes. Final exam date/time cannot be rescheduled. Adequate proof needs to be provided for extenuating circumstances. Work related time conflict does not constitute extenuating circumstance. If you have any work related time conflict, you need to inform me and resolve it in advance. The decision regarding make up will be made at the sole discretion of the instructor. Missed exams/quizzes will be assigned a score of zero.
- Requests for reevaluation of the exam must be made by the end of the NEXT class after the exam is handed back. A reevaluation may result in an increase or decrease in the exam score and that score will be final.
- Scantron forms NOT needed for exams
Quizzes

- The quizzes will be given at the beginning of classes on the dates designated on the course schedule. Each quiz will consist of approximately ten true/false, multiple choice, or very short answer type questions based on the lectures, textbook, and other required readings.
- Quizzes will be closed book and closed notes.
- If you take all six quizzes, only your top five scores will be used in the final grade calculation.
- Scantron forms NOT needed for quizzes

Homework Assignments

- Homework assignments will be individual assignments due by 7:30 PM on the dates designated in the schedule. Instructions for each assignment will be posted on Blackboard.

Deliverable Requirements

- All deliverables shall be in Microsoft Word format.
- All deliverables must be E-MAILED to me, on the due date, each deliverable as an attachment.
- All deliverables must be provided to me in HARD COPY, on the due date, that matches the electronic copy sent via e-mail.
- All deliverables will be professional quality.

Class Participation

- The University policy states: Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation may be a factor in grading, instructors may use absence, tardiness, or early departure as de facto evidence of nonparticipation. Students will be expected to participate in the case discussion and other discussions related to the lecture materials. As such, I am interested in input into the class that contributes to the overall learning of the class, stimulates further discussion and thought, and associates class material with real-world work experiences. Students are encouraged to ask questions in class.

Grade Review

- You can request a review of any grade within one class-period of the day the graded assignment is returned to you. After that period no grade will be revised. You are also required to keep all graded material that is returned to you till after the semester is over and you have checked your final grade. If there is a discrepancy between my records and your scores for any of the graded material at any time, my records will be altered only if you can produce the graded material that I have returned to you as evidence.
Make Up Exams & Quizzes

- Barring extenuating circumstances no exceptions will be made for absence from quizzes or exams. Adequate proof (e.g., doctor's note) needs to be provided to prove extenuating circumstances. Work related time conflict does not constitute extenuating circumstance. The decision regarding make up will be made at the sole discretion of the instructor. In no case will any extra credit assignments be offered.

Learning Disability

- If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 703-993-2474, at the beginning of the semester. All academic accommodations must be arranged through the DRC.

Academic Integrity (Honor Code)

- GMU is an Honor Code university; all students are responsible for knowing and following the GMU Honor Code Statement: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work. In the event of a violation of the GMU Honor Code, the violating student will be reported to the GMU Honor Committee. Another aspect of academic integrity is the free play of ideas. Discussions are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind), please ask me for guidance and clarification.

- GMU Honor Code

Syllabus Revisions

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