Instructor: Raymond J. Curts, PhD
Office Hours: One Hour Prior to Class
Engineering Building, Room 5306
rcurts@gmu.edu

Logistics:

<table>
<thead>
<tr>
<th>Course Dates</th>
<th>24 August through 16 December 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Online</td>
</tr>
<tr>
<td>Meeting Day</td>
<td>Thursdays</td>
</tr>
<tr>
<td>Meeting Time</td>
<td>19:00</td>
</tr>
<tr>
<td>Reference #</td>
<td>Section 001 - CRN 70854</td>
</tr>
<tr>
<td>Assessment &amp; Assignment Deadlines &amp; Due Dates/Times</td>
<td></td>
</tr>
</tbody>
</table>

Administrative Support:

Information Systems and Operations Management (ISOM)
Enterprise Hall
Room 008
703-993-1880

Course Description:

MIS 320: Networks and Security. 3 credits.

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.

Notes: The course also includes lab work and exercises. A third attempt will require academic advisor approval. Offered by School of Business. Limited to two attempts.

Prerequisite(s):

- Grade of C or better in MIS 301, L301, MIS 303, or L303.
- Students with a class of Freshman may not enroll.
- Non-Degree level students may not enroll.
- Students terminated from the BU major may not enroll.
**Introduction:**

Networks have become a 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 data or voice communications. It is necessary for MIS professionals to learn appropriate terminologies and basic concepts that allow them to better discuss computers and data networks, and also be able to understand the design and performance of alternative network architectures. This course examines 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 an understanding of IT security. Several mechanisms that are used to secure large corporate networks will be discussed.

**Course Overview:**

Computer networks are one of the information system components needed to effectively support business operations. Benefits that computer networks may provide include:
- Cost reduction by sharing resources and downsizing desktop computers
- Improved reliability by having multiple sources of supply
- Increased storage capacity
- Improved consistency
- Reduced errors and redundancy
- Overcoming geographic separation
- Centralized management
- Distributed processes
- Controlled security
- Shared data / information / knowledge

Hence, a computer network is an essential component of every business’s infrastructure. Professional workers, managers, and business owners are expected to understand computer networks to effectively utilize them in solving business problems and supporting business operations. MIS professionals, including those who are not directly involved in maintaining the operation of computer networks, must be familiar with computer networking knowledge and skills, such as network architecture, topology, standards, protocols, devices, virtualization, performance monitoring, and security mechanisms.
Mason Core Learning Outcomes:

- Students will understand the principles of information storage, exchange, security, and privacy
- Students will become critical consumers of digital information; they will be capable of selecting and evaluating appropriate, relevant, and trustworthy sources of information.
- Students can use appropriate information technologies to organize and analyze information and use it to guide decision-making.

ISOM Learning Goals:

- Our students will demonstrate an understanding of the social, global, ethical, and legal contexts of business and will be able to reflect on the role of the individual in business.
- Our students will demonstrate an understanding of and the ability to apply knowledge of professional skills necessary for success in business including effective business writing.
- Our students will demonstrate technical and analytic skills appropriate for success in business.
- Our students will demonstrate an understanding of and the ability to apply knowledge of core business disciplines including accounting, finance, information systems, management, marketing, and operations management.
- Our students will demonstrate knowledge and skills appropriate for specialization in their majors.
- Our students will demonstrate an understanding of how research in the business disciplines contributes to knowledge and how such research is conducted.

Course Objectives:

Upon successful completion of this course, students will be able to

- Discuss network architectures and technologies as well as their applications in business
- Describe the principles, functions, and standards of communication networks
- Explain the ISO/OSI 7-layer reference model as well as the related standards / protocols / applications
- Evaluate and select appropriate network devices to satisfy business requirements
- Assess and manage network security related risks
- Apply basic techniques in monitoring network operations and security
- Create, review, evaluate, and refine network security policies and procedures
- Discuss / understand how to secure corporate networks
- Understand the basic terminologies and concepts associated with computer networks
- Understand key architectural principles in computer networking
- Use knowledge of computer networks as part of an IT solution for improving business processes
Computers and Software Used in the Course – Required:

The School of Business undergraduate program requires every student to have access to a portable computing device that satisfies the requirements listed below and can be brought to every class session. Note that as technology changes rapidly, these requirements may change during a student’s time at Mason. Many courses require the use of a computer during class. These are used to learn techniques, practice applications, and access Internet resources. While most students have a portable computer or access to one, some courses require the use of specific applications during class. To address these requirements, a list of standard minimum requirements (including MS Office for Windows) has been determined and will be reviewed annually. In addition, Respondus LockDown Browser with a webcam monitor will be required for all quizzes and exams – i.e., every class. See: https://business.gmu.edu/media/com_managedlists/72/Laptop-Requirements-AY2021_4-20%20update.pdf

Textbooks:

Required Reading:

An online version is available at: https://connect.mheducation.com/class/rcurts-fall-2020

Recommended Reading:

Various government legislation, regulations, executive orders, reports, policies, directives, instructions, and web sites address recommendations for government and business networks and computing systems are available on Blackboard. In addition, a wide variety of supporting materials are available in the library and on the web. Students are encouraged to consult these resources as needed. However, be careful to limit your research to reputable sources. Some web sites, such as blogs and other publicly editable information like Wikipedia, have been shown in many cases to be grossly inaccurate. They should be avoided and are never acceptable academic references.

Readings are intended to be completed before each class.
**Blackboard:**

Registered students will be given access to a section of Blackboard for this course. Blackboard will be used as the primary mechanism (outside of lectures) to disseminate course information, including this syllabus, schedules, announcements, lecture slides, homework, other assignments, quizzes, exams, and grades.

All course materials (lecture slides, assignment specifications, etc.) are published on Blackboard in Adobe® Portable Document Format (PDF). This allows users of most computing platforms to view and print these files. Microsoft® Office for Windows, or a compatible set of applications is required for all assignments. If you use a non-Windows operating system, be sure your Office files are converted as necessary.

Lecture slides are complements to the textbook and outside reading, not substitutes for it. Access to lecture slides is provided in Blackboard as a courtesy to students. The lecture slides and supporting materials on Blackboard supplement the textbooks. Together these are the primary sources of course topics / materials.

All assignments are posted on Blackboard and must be submitted via Blackboard by the deadlines posted in order to receive credit. Assignments sent via email will **not** be graded.

The Discussion section of Blackboard is provided for the use of students. The instructor will **NOT** monitor Blackboard discussions on a regular basis. However, GMU email (*rcurts@gmu.edu*) will be answered promptly, usually within 24 hrs.
Schedule:

The course schedule will follow the outline below; however, it may be rearranged as the term progresses to allow for weather / health closures or other, unforeseen circumstances. Homework is assigned throughout the semester and is due before the date/time of the lecture indicated. Additional homework, not listed here, may be assigned from time to time. Students are encouraged to consult the recommended readings and Blackboard announcements and links regularly for additional information. Students are required to complete the reading assignments before class.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>08/27/20</td>
<td>Introduction / Network Models</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>02</td>
<td>09/03/20</td>
<td>Cabling &amp; Topology</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>03</td>
<td>09/10/20</td>
<td>Ethernet</td>
<td>Chapters 3 &amp; 4 HW 1 Due</td>
</tr>
<tr>
<td>04</td>
<td>09/17/20</td>
<td>TCP/IP Basics</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>05</td>
<td>09/24/20</td>
<td>TCP/IP Basics CIDR &amp; Subnets</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>06</td>
<td>10/01/20</td>
<td>Routing</td>
<td>Chapter 7 HW 2 Due</td>
</tr>
<tr>
<td>07</td>
<td>10/08/20</td>
<td>TCP / IP Applications Midterm Review</td>
<td>Chapter 8 HW 3 Due</td>
</tr>
<tr>
<td>08</td>
<td>10/15/20</td>
<td>MidTerm Exam - Lockdown Browser Required</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>10/22/20</td>
<td>Network Naming</td>
<td>Chapter 9 /</td>
</tr>
<tr>
<td>10</td>
<td>10/29/20</td>
<td>Securing TCP/IP</td>
<td>Chapter 10 HW 4 Due</td>
</tr>
<tr>
<td>11</td>
<td>11/05/20</td>
<td>IPv6</td>
<td>Chapter 12</td>
</tr>
<tr>
<td>12</td>
<td>11/12/20</td>
<td>Remote Computing Wireless Networking</td>
<td>Chapters 13 Chapters 14</td>
</tr>
<tr>
<td>13</td>
<td>11/19/20</td>
<td>Cloud Computing Mobile Networking</td>
<td>Chapter 15 Chapter 16 HW 5 Due</td>
</tr>
<tr>
<td>14</td>
<td>11/26/20</td>
<td>Thanksgiving Recess – No Class</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12/03/20</td>
<td>Cybersecurity / Protecting Your Network</td>
<td>Chapter 19</td>
</tr>
<tr>
<td></td>
<td>12/10/20</td>
<td>Final Exam - Lockdown Browser Required</td>
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Note that in the event of university closures (e.g., due to snow), the instructor may assign on-line work to make up a missed class. On-line sections are typically not cancelled when the university is closed; check with the instructor in such a case.
**Academic Integrity & The GMU Honor Code:**

GMU is an Honor Code university; all students are responsible for knowing and following the GMU Honor Code:

“Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.”

The homework, quizzes, exams, and all other assignments / assessments in this course represent individual work. As always, the GMU Honor Code applies. Stated in English, do the work yourself. If you need help, see the GTA or the instructor. The most frequent violations of the university honor code and policies include but are not limited to:

- Copying or sharing a file / homework or any portion of a file / homework from another student.
- Sharing or allowing another student to copy your files / homework or any portion of a file / homework.
- Duplicating or distributing unauthorized copies of copyrighted software programs, lectures, publications or other materials.
- Unauthorized access or use of university computers, computer systems, or computer networks.
- Creating, sending or distributing electronic chain letters or Spam.
- Using a disk containing a virus in a computer lab or computer system or distributing the virus on the computer network.
- Using the university computers, computer system, or computer network to view or distribute profanity or objectionable material.
- Failing to provide reference citations for all outside material not original to the user.
- Failing to complete quizzes / exams in the designated location and during the time allotted.

The complete Honor Code can be found on the University web site: [https://oai.gmu.edu/mason-honor-code/](https://oai.gmu.edu/mason-honor-code/).

While students are encouraged to exchange ideas, and discuss solutions to problems, students must submit their own, original, work for credit. All students are expected to abide by the George Mason University Honor System and Code (which contains a definition of plagiarism, amongst other things). When in doubt (of any kind), ask for guidance and clarification.

Note that the instructor and the University reserve the right to submit student work for automated testing against other submitted work to confirm a submission’s originality.
**Attendance Policy:**

Students are expected to review each class lecture, to complete any required preparatory work (including readings and assignments – see schedule above) and to participate actively in discussions and exercises both in the classroom and via Blackboard. As members of the academic community, all students are expected to contribute to class discussions regardless of their proficiency with the subject matter.

For online (DL) classes, students are expected to monitor Blackboard on a regular basis. Quizzes, exams, and other exercises will be announced via Blackboard, often on short notice. As a minimum, students should log into Blackboard at or before the scheduled class time each week to ensure they can participate in these activities before the deadline.

Students are expected to make prior arrangements with the instructor if they know in advance that they will miss a class / assignment and to consult with the instructor as soon as possible if they unexpectedly miss any class activity without prior notice.

**Student Responsibilities:**

The student is solely responsible for all assignments, assessments, and material presented in this course. Mastery of the subject matter is measured by skill and proficiency in problem solving. Proficiency is gained by practice. Students are cautioned to avoid falling behind and are responsible for completing every required assignment on time, including homework, projects, presentations and reports.

**Classroom Conduct:**

Students are expected to be punctual, alert, and prepared for each class. Be considerate of other students, i.e., be quiet for the duration of the class period, except when you have something to contribute to the entire class. Please feel free to ask questions and / or offer pertinent comments to the entire class. If you are confused, more than likely, someone else is too. If you need extra help, please schedule an appointment with the GTA or the instructor. *GMU policy prohibits food of any kind in classrooms.*

**Electronic Devices:**

*Cell phones have no place in class*: either leave them behind or turn them off prior to entering the classroom. Please keep cell phones and other communicative devices in silent/vibration mode or off. Laptops or other electronic devices may be used for class related activities such as taking notes, quizzes, or following lectures. Engaging in activities not related to the course is prohibited, such as sending/reading text messages, email, tweets, using apps, etc. You will be asked to leave the classroom, should you violate this policy.
Communications:
Communication with the instructor on issues relating to an individual student must be conducted using GMU email, or in person, not the public forums on Blackboard nor personal email accounts. GMU email is the preferred method for communicating with the instructor (rcurts@gmu.edu); be sure to include the course number and your name. The instructor teaches multiple courses / sections. Without proper identification, you may never receive a response. Email messages from the instructor to all class members will be sent to students' GMU email addresses – if you use another email account as your primary address, you should forward your GMU email to that account. University policy as well as federal privacy laws require the use of GMU email accounts for all correspondence related to academic matters. Any email that you send to the instructor must include the course ID in the subject line and your full name in the body.

Inclement Weather and Other Emergencies:
Class will be cancelled when the campus is closed, either due to inclement weather, health considerations, or other unexpected situations. Please check the GMU website for up-to-date information. Registering with Mason Alert is also a good way to keep abreast of unusual / unexpected situations and to receive timely emergency notifications and warnings. All lectures / class activities are available on Blackboard. Students will be expected to keep up in accordance with the schedule above. Questions concerning activities missed due to an unexpected closure will be addressed at the next available opportunity. Under such circumstances, students are advised to consult announcements in Blackboard for details.
Homework / Discussion Topics:

Homework and discussions will be assigned periodically throughout the semester. This course—like George Mason University as a whole—places a premium on quality writing. Students are expected to synthesize a large amount of information and present their own original, independent analysis of these facts in clear, concise text. The APA Style Guide shall be used for all submissions in this course. Format your papers accordingly.

Homework and discussions are submitted through Blackboard and are due before class on the date specified – even if the campus is closed due to some unexpected situation. Homework must be formatted in accordance with APA guidelines and contain references (including the textbook and lecture materials) as applicable. All homework materials (charts, diagrams, text, etc.) may be generated in MS Office for Windows and / or Office compatible software as appropriate and uploaded to Blackboard. Note that files created in Apple / Mac versions of Office are not compatible with Windows unless converted by the originator. Do not submit pdf files. Be sure to include your name on all homework assignments. In order to ensure that homework is properly credited, all files shall use the following naming convention:

**MIS 320 F20 HW? Username.****xxx

Where “?” represents the homework number, “Username” is your student email / Blackboard ID and “xxx” represents the type of document (.docx, .xlsx, .pptx, .zipx, etc.). If your submission requires multiple files, combining them into a single Zip file for upload is recommended. For example, homework number two in the Fall 2020 section, submitted by a student named John Smith, using a Zip format would be labeled:

**MIS 320 F20 HW2 JSmith.zip.**

All homework and discussions are required to be submitted on time in order to receive credit.

**EXCEPT IN VERY EXTRAORDINARY DOCUMENTED CIRCUMSTANCES, LATE HOMEWORK WILL NOT BE ACCEPTED.**

All homework assignments are completed by the student and presented to the instructor as partial fulfillment of course requirements. As such the instructor and the University reserve the right to use student coursework as classroom examples for this class, future courses / classes, and other educational purposes as appropriate.
Quizzes & Exercises:
Exercises and quizzes will be conducted in selected class sessions throughout the semester. Quizzes and exercises will not be announced in advance. Any student who misses an exercise or quiz due to an unexcused absence will receive zero (0) for that exercise. Students should expect a quiz or exercise every class session.

Exams:
University policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. In accordance with policy, students who arrive more than 15 minutes late for any exam will not be permitted to take the exam and will automatically receive a grade of zero for the exam. Makeup exams are very rarely given. Requests for a delayed exam due to multiple tests (>2) in one day will ONLY be considered if the proper forms are completed and in the instructor’s hands well before the scheduled exam date. Failure to attend a scheduled exam may result in a score of zero (0) for that exam.

Exams are intended to test the students’ knowledge and understanding of the materials discussed in the readings and lectures. Consequently, each test may include Short Answer and/or Essay questions, plus Completion, True/False, Multiple Choice, Multiple Response and Matching type questions. The midterm exam will cover the first half of the course material as indicated on the class schedule. The final exam will be cumulative – everything from the first through the last lecture. Both exams will include materials covered in the lectures, textbook, assignments, quizzes, exercises, other required readings, etc. Exams will be closed book and closed notes.

Makeup Exams:
Barring extenuating circumstances, no exceptions will be made for absence from quizzes or exams. Adequate proof (e.g., a doctor’s note, police report, or some other official documentation) must be provided to prove extenuating circumstances. Work-related time conflict does not constitute extenuating circumstance. The decision regarding makeup will be at the sole discretion of the instructor.

Extra Credit:
There are NO extra credit opportunities in this course. If you concentrate on doing the best you can with each of the scheduled assignments and assessments, there should be no need for extra credit.
Respondus Lockdown Browser:
The Respondus Lockdown Browser with a webcam monitor will be required for all quizzes and exams. The browser is a free download from Blackboard. Log into the My Mason portal, select the “Courses” tab at the top and you should find a link to the browser download in the middle of the page directly under your course list: LockDown Browser/Monitor Application (student download for Mac or Windows). The browser version is connected directly to the Mason Blackboard site, so you must download and install from the My Mason portal. Downloads from other locations will not work at GMU. Students are encouraged to install and test the browser well before lecture one. A practice quiz has been created under “Assessments” for browser and webcam verification purposes. Respondus is NOT currently supported on Chrome and Unix/Linux operating systems. Students using an unsupported platform will be required to utilize a different system for quizzes and exams. If you have difficulty, contact tech support. The instructor cannot help with software issues. All students are expected to bring a fully charged computing device loaded with an operational, tested version of Lockdown Browser and webcam to every class. Makeup quizzes and exams will not be permitted due to computer and/or browser failure. Test your system thoroughly before class.
**Campus Services:**

Several campus services are available to students. You are encouraged to make use of them as needed. A few are listed here for easy reference:

- **Writing Center:** Good writing skills will become more and more important as your education and career progress. If you struggle with proper formatting, punctuation, sentence structure, grammar, etc., a visit to the writing center can help. A114 Robinson Hall; 703.993.1200; [http://writingcenter.gmu.edu](http://writingcenter.gmu.edu)

- **Office of Disability Services (ODS):** If you are a student with a disability and you need academic accommodations, please contact the instructor and the Office of Disability Services (ODS) at 703.993.2474 at the beginning of the semester. All academic accommodations must be arranged through the ODS ([http://ods.gmu.edu](http://ods.gmu.edu)) well before any accommodation is needed.

- **Counseling (CAPS):** Counseling & Psychological Services (CAPS); 703.993.2380; [http://caps.gmu.edu](http://caps.gmu.edu)

- **Student Advocacy (SSAC):** Student Support and Advocacy Center (SSAC); 703.380.1434; [https://ssac.gmu.edu/](https://ssac.gmu.edu/)

- **Title IX Coordinator:** Mason’s Title IX Coordinator; 703.993.8730; [titleix@gmu.edu](mailto:titleix@gmu.edu)

- **Sexual Harassment:** Mandatory Reporting of Sexual Assault, Violence, and Stalking: As a faculty member, instructors are designated as a “Responsible Employees” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as:
  - Student Support and Advocacy Center (SSAC), 703.380.1434 or
  - Counseling and Psychology Services (CAPS), 703.993.2380 or
  - Mason’s Title IX Coordinator, 703.993.8730 or email at [titleix@gmu.edu](mailto:titleix@gmu.edu)

- **University Policy:** The University Catalog, [http://catalog.gmu.edu](http://catalog.gmu.edu), is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at [http://universitypolicy.gmu.edu](http://universitypolicy.gmu.edu). All members of the university community are responsible for knowing and following established policies.
Grading:

Grades will be awarded in accordance with the GMU Undergraduate Grading System as follows:

<table>
<thead>
<tr>
<th>Numeric Grade</th>
<th>Grade</th>
<th>Quality Points</th>
<th>Pass / Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>97% - 100%</td>
<td>A+</td>
<td>4</td>
<td>Satisfactory / Passing</td>
</tr>
<tr>
<td>93% - 96%</td>
<td>A</td>
<td>4</td>
<td>Satisfactory / Passing</td>
</tr>
<tr>
<td>90% - 92%</td>
<td>A-</td>
<td>3.67</td>
<td>Satisfactory / Passing</td>
</tr>
<tr>
<td>87% - 89%</td>
<td>B+</td>
<td>3.33</td>
<td>Satisfactory / Passing</td>
</tr>
<tr>
<td>83% - 86%</td>
<td>B</td>
<td>3</td>
<td>Satisfactory / Passing</td>
</tr>
<tr>
<td>80% - 82%</td>
<td>B-</td>
<td>2.67</td>
<td>Satisfactory* / Passing</td>
</tr>
<tr>
<td>77% - 79%</td>
<td>C+</td>
<td>2.33</td>
<td>Unsatisfactory / Passing</td>
</tr>
<tr>
<td>73% - 76%</td>
<td>C</td>
<td>2</td>
<td>Unsatisfactory / Passing</td>
</tr>
<tr>
<td>70% - 72%</td>
<td>C-</td>
<td>1.67</td>
<td>Unsatisfactory / Passing</td>
</tr>
<tr>
<td>60% - 69%</td>
<td>D</td>
<td>1</td>
<td>Unsatisfactory / Passing</td>
</tr>
<tr>
<td>0% - 69%</td>
<td>F</td>
<td>0</td>
<td>Unsatisfactory / Failing</td>
</tr>
</tbody>
</table>

*Although a B- is a satisfactory grade for a course at this level, students must maintain a 3.00 average in their degree program and present a 3.00 GPA on the courses listed on the graduation application.*

Raw scores may be adjusted (i.e., a curve may be applied) by the instructor to calculate final grades. Grades will be assigned as follows:

- 20% - Homework
- 20% - Quizzes
- 25% - Mid Term Exam
- 35% - Final Exam

Note that homework, and quizzes account for a substantial portion of your grade. Failure to submit homework on time, skipping class, or failing to participate in discussions and exercises will have a significant negative impact on your final grade.

**If you have any questions or concerns related to any aspect of this course and/or related requirements, discuss them with the Instructor WELL BEFORE they become an issue.**