Business Data Communications and Networks

MET CS-625

Course Description

MET CS625 – A1 / A2
Business Data Communication and Networks

Prerequisite : BU MET CS200 or Instructor Consent.

***Note*: This course cannot be taken with CS425 or CS535, only one of these can be counted toward degree requirements.**

Computer networks dominate today's information technologies and are essential for any business to compete in the global marketplace. This course is intended to provide you with knowledge and understanding of basic concepts of data communication in business environments as well as of computer networks and protocols. The material will be presented in the context of the Internet reference model, with particular focus on the Physical, Data Link, and Network layers. Frequently used protocols are presented, which illustrate concepts and provide insight into practical networks. Examples include widely used network protocols, such as the TCP/IP suite, and Optical Networking. Those who have completed the course will have a solid knowledge of computer networks and data communications.

Course Overview

This course begins with a brief history of communications, information systems, and the Internet in order to help the student understand the evolution of different network models and current standards. Application architectures, and their relevance to specific network-based applications—such as the Web, streaming, and other relevant applications. The Physical Layer is presented in the form of basic data communications concepts over both wired and wireless transmission media. Data Link layer responsibilities including media access, error control, data link protocols, and transmission efficiency are covered. The basic functions of the Network and Transport layers are explained in context of design issues, addressing, routing, and internetworking. The TCP/IP suite of protocols is used for an in-depth example. LANs are covered in detail including components, Ethernet, design, and performance. Wireless networks including Wi-Fi, Bluetooth, and Cellular, along with best practices in WLAN design are then presented. Networks are covered in depth in order to address the needs of an enterprise backbone, including components, architectures, virtual LANs, and technologies. Moving from the local area

networking environment, metropolitan and wide area networking technologies are covered. The course then concludes with coverage of network security, network design, and network management.

Course Objectives

The course will enable you to:

- Understand the role of network layering, the Internet Layer Model, and current standards
- Understand the major application architectures and applications that follow them
- Be familiar with the different types of network circuits and media, as well as understand how analog/digital data is transmitted with analog/digital signals
- Understand how communication is done reliably
- Understand how messages are moved from end to end via routers and switches
- Understand LAN and WLAN technologies and be able to design a LAN and a WLAN
- Understand enterprise LAN technologies, including backbones, Ethernet, Optical
- Understand circuit switched, dedicated circuit, and packet switched services
- Understand the overall design of the Internet and access technologies
- Understand network security, design, and management issues

Learning Outcomes

By successfully completing this course you will be able to:

- Use and understand networking terminology
- Be able to design a complete network
- Choose a networking technology suitable to solve a business problem
- Successfully communicate with networking professionals
- Apply basic network and security management techniques
- Understand and evaluate new networking technologies
- Be able to advance your knowledge of networking by taking additional courses or self study

Instructor

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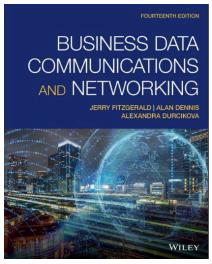
Office Hours : by appointment in person / *Virtual if needed

The best way to reach me outside of our class sessions is to email me at my BU email address. I normally pick up my course and regular emails many times throughout the day.

Course Materials and Resources

Required Course Materials



Business Data Communications and Networking, 14th Edition

Jerry FitzGerald, Alan Dennis, Alexandra Durcikova

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This textbook can be purchased from Barnes and Noble at Boston University. This course does *not* require you to have access to any premium content or access cards from the textbook. We rely only on the standard textbook content itself, so it is possible for you to obtain a used copy or an electronic copy if you are interested.

Courseware : Blackboard, Zoom, and various posted lecture material posted through the class site will be used this semester.

Academic Conduct Code

1) **All Students will be required to read and accept the Boston University Metropolitan College Graduate Student Academic Conduct Code Agreement.**

2) ***This must be accepted prior to the course material becoming available in the class site. There will be a prompt of your course Homepage within Blackboard which will allow you to accomplish this.***

3) **Please note:** Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions. Thus you should take the time to review the Student Academic Conduct Code and **not just** "click" that you accept it.
4) Any / All of your course deliverables may be verified through Turnitin or SafeAssign utilities to assure that your work does not include an excessive amount of non-original work. You should put everything in your own words to exemplify that you understand the material being covered.
5) Using sites such as CourseHero, etc. are a direct violation of the Boston University Code of Academic Conduct, and doing so may result in disciplinary action.
6) While we encourage each student to become familiar with AI applications such as ChatGPT, Bard, etc. You should NOT be submitting your deliverables to them and then submitting this as your own work.

   http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html.

   NOTE: [This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. On the contrary – you should share your thoughts, questions and solutions. Naturally, if you choose to work in a group, you will be expected to come up with more than one and highly original solutions rather than the same mistakes.]

Boston University Library Information

Boston University has created a set of videos to help orient you to the online resources at your disposal. An introduction to the series is below: { click on the embedded link }

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Download

All of the videos in the series are available on the Online Library Resources page, which is also accessible from the Campus Bookmarks section of your Online Campus Dashboard. Please feel free to make use of them.

As Boston University students, you have full access to the BU Library. From any computer, you can gain access to anything at the library that is electronically formatted. To connect to the library, use the link http://www.bu.edu/library. You may use the library's content whether you are connected through your online course or not, by confirming your status as a BU community member using your Kerberos password.

Once in the library system, you can use the links under "Resources" and "Collections" to find databases, eJournals, and eBooks, as well as search the library by subject. Some other useful links follow:

Go to http://www.bu.edu/library/research/collections to access eBooks and eJournals directly.

If you have questions about library resources, go to http://www.bu.edu/library/help/ask-a-librarian to email the library or use the live-chat feature.

To locate course eReserves, go to http://www.bu.edu/library/services/reserves.

Please note that you are not to post attachments of the required or other readings in the water cooler or other areas of the course, as it is an infringement on copyright laws and department policy. All students have access to the library system and will need to develop research skills that include how to find articles through library systems and databases.

Study Guide

The following material is collected here for your convenience.

Module 1 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 1 - Introduction to Networking; Chapter 2 - Application Layer; Chapter 3 - Physical Layer

Assignments: Concepts Assignment 1 and Lab 1 ***Refer to Calendar for Due Dates***

Assessments: Quiz 1 ***Refer to Calendar for Due Dates***

Module 2 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 4 - Data Link Layer; Chapter 5 - Network and Transport Layers

Assignments: Concepts Assignment 2 and Lab 2 ***Refer to Calendar for Due Dates***

Assessments: Quiz 2 ***Refer to Calendar for Due Dates***

Module 3 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 6 - Network Design; Chapter 7 - Wired and Wireless Local Area Networks

Assignments: Concepts Assignment 3 and Lab 3 ***Refer to Calendar for Due Dates***

Assessments: Quiz 3 d ***Refer to Calendar for Due Dates***

Module 4 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 8 - Backbone Networks; Chapter 9 - Wide Area Networks

Assignments: Concepts Assignment 4 and Lab 4 ***Refer to Calendar for Due Dates***

Assessments: Quiz 4 ***Refer to Calendar for Due Dates***

Module 5 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 10 - The Internet; Chapter 11 - Network Security

Assignments: Concepts Assignment 5 and Lab 5 ***Refer to Calendar for Due Dates***

Assessments: Quiz 5 due ***Refer to Calendar for Due Dates { if assigned }***

Module 6 Study Guide and Deliverables

Readings: Online lecture material plus the following chapters from the textbook: Chapter 12 - Network Management

Assignments: Combined with Module-5 Assignments.

Final Exam Details

The Computer Science department requires that all final exams in the program be proctored **as an in person exam**. The Final Exam in this course will be held on the last day / evening of class : **Refer to the Class Site for the Applicable Date.**

The final exam is planned as a two hour, closed-book comprehensive exam covering the material from the entire course. The exam will **only** be accessible during the final exam period. Students can access it from the Assessments section of the course, and Each student will need to enter a password to access it.

During the final exam, students are required to work independently without using any additional notes or material. The Final is usually a closed-book exam so accessing online material, lecture notes, emails, discussion boards, chat features or any other online material during the exam is not permitted, and some features of the online course may be disabled. So No, you cannot use ChatGPT or other AI application to supplement your answers.

Please note that student activity during the final exam may be monitored and recorded in log files. Accessing any online or other material during the final exam is a major violation of the course policy and may result in serious academic disciplinary actions.

Course Grading Information

Course Structure

The course is organized as a sequence of six main modules. Each of the six modules will include textbook readings and assignments from the course text. All of the modules may also include graded labs, and quizzes.

Grade Weighting

The following table summarizes the six kinds of graded items and the default percentage of grades determined by each of these kinds of graded items. Each of these graded items is explained below.

note: Due to the mixed sections and combinations thereof which makeup this class the complete / detailed grading structure by will be explained in class. If you have any questions you should address them directly with your instructor. The table below is a reference and the weights may be adjusted by the instructor, you should reference the first lecture set for accuracy.

Reference - Base Grading Distribution	
Deliverable	**Weight**
Discussion / Participation	5%
Labs	5%
Quizzes	15%
Homework Assignments	10%
Term Project / Presentation	20%
Mid-Term Exam	15%
Final Exam	30%
TOTAL	100%

Concepts Assignments / Homework

In each of the course modules you will complete concepts assignments / Homework that help you solidify the concepts you have read in the textbook and online lectures. In order to obtain full credit, your answers should be in paragraph / essay form for each question, and must **NOT** be simply cut and paste from the class text or any other resources. Due to the availability of the Homework Assignments from the first weekly lecture, **No assignment will be accepted late for credit.**

Note: No Assignment will be accepted / allocated full credit which has a SafeAssign score greater than 35% with the questions embedded into your submission.

If anything is submitted with a score that exceeds this, it may be overridden as a zero for the submission. No Exceptions. The minimum point deduction will be 20%.

Note: No Assignment will be allocated full credit which does not list your question material sources regardless of where they are from, this includes the course textbook. ***The minimum point deduction will be 20%. For not listing sources / references.***

Labs

In each of the first modules you will complete TCP/IP labs that help you gain important technical skills in data communications and IP networking. Due to the availability of the Labs from the first weekly lecture, **No Lab deliverable will be accepted late for credit.**

Project

Every registered student must complete a Team Project and Presentation to the class. The structure follows the module learnings as they progress through the semester. The Topic will range in areas from trends in Data Communications to Security and management, but final approval is at the discretion of the instructor and must be discussed and approved by the fifth week of class. Team projects are the students responsibility as far as equal cooperation and participation, and as always any issues should be brought to the Instructor as they arise.

Quizzes

There is generally one graded quiz for each of the modules, As the timing permits there will be a minimum of four up to six quizzes. The results for your quiz will be released as soon as possible after the quiz closes. When the quiz grades are released you will not be able to see the questions, your answers, etc. This is done to protect the integrity of the material, and you have the option to list any questions you may have in the last section of the quiz before you submit. Quizzes will be open for a minimum of five (5) days in which you must select an opportune time for you to dedicate sixty (60) minutes. Once a quiz is started, it cannot be paused, therefore you need to select ample time during the window. Due to the availability of the Quizzes with a five day window, **No Quizzes will be accepted late for credit.**

Note: if you experience technical difficulties while taking a quiz you should email the instructor immediately stating the issue and your quiz will be reset.

Mid-Term Exam

Your Mid-Term exam will be offered after the midpoint of the class schedule. You will have two hours to complete it; which should be plenty of time. Your Mid-Term exam date will be known at least two weeks prior to it being scheduled, and you **must** take it **in person** in class on the scheduled day / evening. **Note:** *The intent of the Mid-Term exam is to evaluate your mastery of the course material, so that if you learn the* course material well, you will do well on this and the final exam.

If for some reason you cannot take the exam at the scheduled time, you must notify the Instructor as soon as this is know, and alternate arrangements **may** be made for you to come on campus to complete the exam - **before** the scheduled exam date. This will be scheduled during normal class hours, so there should be no reason to miss the date.

Note that your overall Mid-Term exam score will be released to you, **but the questions, answers, etc. will not be released.** This is to maintain the integrity of the Mid-Term exam for concurrent and future online and on-campus sections of this course.

The Final Exam

Your final exam will be offered in the last week of the course. You will have two hours to complete it; which should be plenty of time. Your final exam will be proctored by the instructor and you **must** take it **in person** on campus on the scheduled day / evening. **Note:** *The intent of the final exam is to evaluate your mastery of the course material, so that if you learn the* course material well, you will do well on the final exam.

If for some reason you cannot take the exam at the scheduled time, you must notify the Instructor as soon as this is know, and alternate arrangements may be made for you to come on campus to complete the exam - **before** the scheduled exam date. If you find that you cannot take it in the time frame required, then you should opt to take an Incomplete and take it as soon as possible thereafter.

Note that your overall final exam score will be released to you, **but the questions and answers will not be released.** This is to maintain the integrity of the final exam for concurrent and future online and on-campus sections of this course.

Grading Structure

All of your deliverables: assignments, quizzes, term project, Mid-Term and final exam will be graded on a percentage basis. The following table summarizes typical correspondence of percentage grades and letter grades for individual graded items.

Grade Scale for class below :

Letter Grade	Honor Points	Decimal Range
A	4.0	95 +
A-	3.7	91 - 94
B+	3.3	88 - 90
B	3.0	84 - 87
B-	2.7	81 - 83
C+	2.3	78 - 80
C	2.0	74 - 77
C-	1.7	71 - 73
D	1.0	68 - 70
F	0.0	Below 67

The decimal range shows whole numbers, actual is always From X.00 to Y.99 (i.e. 91.00 – 94.99)

Note that **C** is the **lowest** grade that satisfies degree requirements in graduate courses, and that you need to maintain a grade point average of 3.0 or better to graduate. For more information, see the MSCIS Academic Policies online manual.

The percentage ranges above are approximate. Your letter grade is determined by your professor as the best overall measure of how well you have demonstrated that you understand the material, taking

into separate consideration your performance in the quizzes, assignments, term project, and final exam. Additional grading criteria include any substantial difference in your performance on the proctored final exam and the general trend of your scores over the term.

Lateness with Course Deliverables

We recognize that emergencies and unexpected but significant extensions in work hours occur in professional and personal lives. If one occurs that prevents your completion of a course item by a deadline, please make this plain to your instructor. This must be done well in advance of the deadline (unless it is an emergency that makes this impossible, of course), and should be accompanied by particulars that back it up. Additional documentation may be requested. If this is permitted at the discretion of the instructor, a minimum of Twenty points will otherwise be deducted for late submissions on a per day basis: we want to be fair to everyone in this process, including the vast majority of you who sacrifice so much to submit your homework on time in this demanding schedule.

General Attendance

This is a graduate level course, and weekly attendance is not taken on a weekly basis. However it may be taken during the weeks of class presentation and In-Person exams. On Campus classes are scheduled with a minimum of fifteen minutes between each class, and late arrivals should not be necessary and prove to be disruptive to class proceedings. Repeated late arrivals will be met with an invitation to sit up front where there is always extra room. This is also the policy for chronic late returns from class break. Remember that part of the grade is Discussions and Participation.

General Quiz Instructions

You will have access to the quiz on the Sunday of the week that they are assigned. (re: the course calendar for the assigned weeks) The quiz closes at midnight of the assigned date, (i.e. Sunday - Friday) If you are going to miss the deadline for any reason you should contact your facilitator and instructor Prior to the Quiz Window. **No Quizzes will be accepted after the assigned due date**.

Quiz Details

- You can access the quiz details from the assessments menu.
- You will have **60 minutes** to complete the quiz. If you should exit the quiz and re-enter at a later time **the clock is still running** during the time you had left the quiz.
- Each quiz has twenty (20) :: choose-best and multiple-choice questions.
- There is a 21st question (worth 0 points) where you may optionally provide comments. These comments will be reviewed by your facilitator and considered when he/she grades the quiz. This is an opportunity for you to let us know if you feel that a certain question or answer had some ambiguity, or you want to clarify your choice for a certain question.
- Not every student will have the same identical quiz questions. The quiz is generated for each student from a large question pool.
- The order of all questions and answers is randomized.
- The points for each question are shown.
- The quiz questions will display one at a time on your screen.
- You may skip over questions and revisit them in any order.

Also note:

- **You can take each quiz only once. Even if the quiz shows multiple attempts, you should NOT proceed to any subsequent attempt without first checking with your instructor. There are no exceptions to this regardless of the circumstances.**
- You may be able to continue to save answers to questions after the time has expired, but any late answers will be time stamped and marked as late. This will allow us to grade your quiz fairly in the event that technical difficulties occur while you take your quiz.
- Click only the radio button/check box to choose an answer. Clicking in white space around the question choice can sometimes select that choice.

How to Handle Technical Difficulties with a Quiz

If you experience technical issues with your quiz, sometimes you will be able to continue simply by reconnecting to Blackboard and then continuing. However, if you cannot simply reconnect and continue with your quiz. (i.e. the state is changed to "submitted", etc.) then you should email your Instructor and Facilitator / TA noting the circumstances and time of the issue. In most cases this will result in the Instructor resetting your quiz, whereby you will need to take it again in completion. Most times it is not possible to reset and preserve prior responses.

If this does happen an exception may be given that allows you to retake the quiz even if the window has expired.

Note: if you are experiencing issues with the site access to a quiz, then you should contact eLive elivesvc@bu.edu and copy your instructor and facilitator / TA as well.

Saving Answers

- To answer a multiple choice question, select the appropriate choice from the list below the question.
- When you have completed your response, click "Save Answer" at the top of the question.
- As you proceed through the exam, you can go back and edit previous responses that you saved.
- A timer is displayed above the questions tracking the remaining time available.
- You will see question number buttons above questions. You will need to click on "Question Completion Status" to see the question numbers. You can use these buttons to navigate from question to question at any time.
- When you have completed all answers, go to the last question of the exam and click the "Save and Submit" button.

Other Questions

If you have any questions about the quiz please feel free to contact your facilitator and / Or Instructor. Not all classes have Facilitators, therefore if you do not, then this should be simply be understood as to contact your instructor.

Technical Support

Assistance with course-related technical problems is provided by the IS&T Help Center. To ensure the fastest possible response, please fill out the online form using the link below.

IT Help Center Support	
Email	ithelp@bu.edu Please use "BB Learn Question" in the subject line
Web	http://www.bu.edu/tech/web/course-sites/blackboard-learn/
Phone	(888) 243-4596