

# BU MET CS-625 Syllabus

## Course Description

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**MET CS625 – A1 – A2 – E1 – SC1**

### **Business Data Communication and Networks**

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. Those who have completed the course will have the basic knowledge of computer networks and data communications.

## Course Overview

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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, email, ftp, telnet, and IM—are presented. 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, WiMAX, Bluetooth, and 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, technologies, and best practices in design. Moving from the local area networking environment, metropolitan and wide area networking technologies are covered.

The course then concludes with significant coverage of network security, network design, and network management.

## Course Objectives

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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

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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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## Scot Arena

Senior Lecturer

Computer Science Department

Metropolitan College

Boston University

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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 email many times per day.

## Initial Course Developer

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### Lou Chitkushev, Ph.D.

Computer Science Department

Boston University Metropolitan College

1010 Commonwealth Ave

Boston, MA 02215

Professor Chitkushev is the Associate Dean for Academic Affairs; Associate Professor, Computer Science; Director, Health Informatics and Health Sciences at Boston University's Metropolitan College.

He is co-founder and Associate Director of the Boston University Center for Reliable Information Systems and Cyber Security (RISCS), which was established to promote and coordinate research on reliable and secure computation and information assurance education by developing ideas and tools to protect critical computational infrastructure and producing a growing number of highly educated research professionals with expertise in information reliability and security.

Professor Chitkushev was part of the academic team that played a crucial role in the initiatives leading to Boston University's designation as a National Center of Academic Excellence in Information Assurance Education and Research by the National Security Agency and U.S. Department of Homeland Security.

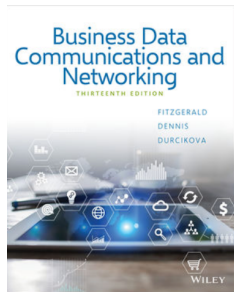
Throughout his career, Dr. Chitkushev has made scientific contributions and has lectured in the areas of data communications, advanced Internet technologies, medical informatics, and network security. He has served on a number of scientific committees and international telecom standard bodies, and has been a review panelist for the National Science Foundation.

Professor Chitkushev holds a Ph.D. in Biomedical Engineering (Bioinformatics) from Boston University, an M.S. in Biomedical Engineering from Medical College of Virginia, and an M.S. and B.S in Electronics and Telecommunications from University of Belgrade, Yugoslavia. He has extensive international industrial and academic consulting experience in the areas of telecommunications, data assurance, and biomedical informatics, with a number of leading IT corporations and government agencies.

## Course Materials and Resources

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### Required Course Materials



Fitzgerald, J., Dennis, A., & Durcikova, A. (2017). *Business data communications and networking* (13th ed.). Hoboken, NJ: John Wiley & Sons. ISBN ISBN: 978-1-119-36883-0.

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.

### 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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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

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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 *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.

Consequently, the Final Exam in this course will be held on the last evening of class : **Refer to the Class Site for the Applicable Date.**

The final exam is 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 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.

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 can result in serious academic disciplinary actions.

# Course Grading Information

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## 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

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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.*

<b>Reference - Base Grading Distribution</b>	
<b>Deliverable</b>	<b>Weight</b>
Discussion / Participation	10%



Labs	10%
Quizzes	15%
Homework Assignments	15%
Term Project / Presentation	20%
Final Exam	30%
TOTAL	100%

## Concepts Assignments / Homework

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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 which has a SafeAssign score greater than 20%**

***If anything is submitted with a score that exceeds this, it will be overridden as a zero for the submission. No Exceptions.***

## Labs

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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 assignment will be accepted late for credit.**

## Project

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Every registered student must complete a Term Project in network design, the structure follows the module learnings as they progress through the semester. There may be Alternate projects completed, but this is at the discretion of the instructor and must be discussed and approved by the fifth week of class. The Summer 2020 Semester will default to the alternate Project option for all students. This will be discussed / reviewed in the first class meeting.

## Quizzes

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There is 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 quizzes are released you will be able to see the questions, your answers, the correct answers. Quizzes will be open for a minimum of five (5) days in which you must select an opportune time for you to dedicate seventy (70) 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.***

## The Final Exam

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Your final exam will be offered in the last week of the course. You will have two hours to complete it; there should be plenty of time. Your final exam will be proctored and you must take it in person on campus on the scheduled evening. **Note:** *The Summer 2020 final Exam will be held via a Zoom Class meeting whereby every student will be Required to have their webcam on and you must remain viewable for the duration of the exam. 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 on the scheduled evening, you must notify the Instructor as soon as this is know, and alternate arrangements may be made for you to come on campus and take it during the day - **before** the scheduled exam date. If you cannot take it when required 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 runnings of this course.

## Grading Structure

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Your assignments, quizzes, term project, 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
<b>A</b>	<b>4.0</b>	<b>95 +</b>
<b>A-</b>	3.7	91 - 94
<b>B+</b>	3.3	88 - 90
<b>B</b>	3.0	84 - 87
<b>B-</b>	2.7	81 - 83
<b>C+</b>	2.3	78 - 80
<b>C</b>	2.0	74 - 77
<b>C-</b>	1.7	71 - 73
<b>D</b>	1.0	68 - 70
<b>F</b>	<b>0.0</b>	<b>Below 67</b>

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

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.

## Quiz Instructions

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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

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- You can access the quiz details from the assessments menu.
- You will have **70 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 20 choose-multiple 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 will 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

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 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](mailto:elivesvc@bu.edu) and copy your instructor and facilitator as well.

## Saving Answers

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- 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

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If you have any questions about the quiz please feel free to contact your facilitator and Instructor.

# Technical Support

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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.

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