

MET CS 535 Computer Networks

2025 Fall 1 Online Course Syllabus

Instructor

John Day, day@bu.edu

Course Duration

Start: September 2, 2025

End: October 20, 2025

Course credits

4 credits

Course Description

This course provides a robust understanding of networking. It teaches the fundamentals of networking systems; their architecture, function, and operation; and how those fundamentals are reflected in current network technologies. Students will learn the principles that underline all networks and the application of those principles to current network protocols and systems. The course explains how layers of different scopes are combined to create a network. There will be a basic introduction to physical media; the functions that make up protocols, such as error detection, delimiting, and lost and duplicate detection; and the synchronization required for the feedback mechanisms: flow and retransmission control, etc. Students will be introduced to how these functions are used in current protocols, such as Ethernet, WiFi, VLANs, TCP/IP, wireless communication, routing, congestion management, QoS, network management, security, and common network applications as well as some past applications with unique design solutions.

Prerequisite: MET CS 200 or instructor's consent

Restrictions: This course may not be taken in conjunction with MET CS 625 or MET CS 425 (undergraduate). Only one of these courses can be counted towards degree requirements.

Course Learning Objectives

By successfully completing this course, you will be able to do the following:

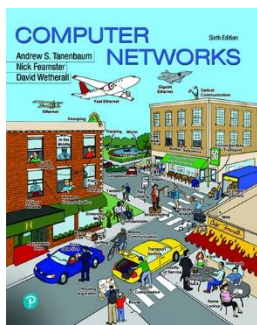
- Use the terminology associated with computer networking correctly. In particular, you will be able to distinguish the difference between graph and topology and between bandwidth and data rate.
- Apply implications that networking is interprocess communication and the scope of layers.
- Discuss the requirements that the data link layer must meet for the transport layer

and articulate how and why the protocols in the two layers are both the same and different and are only needed when a layer has more than two members.

- Discuss (a) the importance of the sliding window for flow and retransmission control and the peculiar effect of modular arithmetic on it, (b) the implications for system design of static vs. pooled buffer management, and (c) the role of traffic density in the use of virtual circuit vs. connectionless techniques and its relation to maximum packet size.
- Discuss the purpose of a network having application names, node addresses, and point of attachment addresses, and what they enable.
- Discuss when to use link-state, distance-vector, and path vector routing algorithms and the role of addresses in these methods.
- Determine the contributing factors to router table growth.
- Explain why congestion management is an n-party stochastic phenomenon caused when too many PDUs arrive at a router.
- Discuss why explicit congestion notification is crucial to an internet and the implications of the fact that the effectiveness of any congestion management strategy will decrease with increasing time to notify.
- Discuss that the necessary and sufficient condition for synchronization for reliable data transfer is to enforce an upper bound on three times.
- Determine the security principles, such as every layer should protect itself, including the applications, and why no identifier carried in protocol should be exposed to the layer above.

Course Materials

Required Book



Tanenbaum, A., Wetherall, D., & Feamster, N. (2020). *Computer Networks* (6th ed.).

Publisher: Pearson

ISBN: 978-0136764021

How to Purchase and Access eBook through First Day™ from Your Course

To enhance your learning experience and simplify access to the right materials for your class, your course materials have been integrated directly into your course.

Benefits of This Program

- Exclusive preferred pricing
- Guaranteed the right materials

- Single Sign-On
- Ready to go on day one
- Course materials charge will be placed on your student account
- Option to Opt-Out on the first day of class.

Accessing Your Materials

- Log into your course site on September 2, 2025 after 10 AM.
- On the left-hand course menu, click “**Course Materials (B&N First Day)**”.

Notes:

Boston University will bill you at the discounted price as a First Day course material charge on your student account later in the semester.

Please be advised it is NOT recommended that you Opt-Out, as these materials are required in the course to complete the course. You can choose to Opt-Out on the first day of class, but you will be responsible for purchasing your course materials at the Opt-Out price.

For more information and FAQs, check [Customer Care](#).

Notes:

1. This textbook will be referred to as the “Tanenbaum” book. There are **known errors in the homework problem numbers**. We will have to be careful about that.
2. While the Tanenbaum textbook is the required text, **it is strongly recommended to read the module narratives first** and then the parts of Tanenbaum that the module narratives point to. The student, of course, can read all of Tanenbaum they desire, but some of it is wrong or misleading. This could be a good source of questions in class.
3. Do NOT buy the Global Edition of Tanenbaum, often called the International Edition, because the numbers of the problems are different.

Special Note: There are no good networking textbooks. They are all written for a vocational school, not a university, and they are full of errors. I have found the Tanenbaum book to be the least objectionable. The course module lectures will cover the principles of networking and Tanenbaum will provide details about what is out there today. Exams will cover both Tanenbaum and the module lectures.

Study Guide and Timeline of Deliverables

Module 1 Study Guide and Deliverables

(September 2 – September 8, 2025)

Module Topics: Introduction and Overview; Lessons in Application Design

Readings:

- Module 1 online notes
- Tanenbaum book, Chapter 1

Assignments:

- Quiz 1 due **Wednesday, September 10, at 6:00 AM ET**
- Assignment 1 due **Wednesday, September 10, at 6:00 AM ET**

Live Classrooms:

- Wednesday, September 3, from 7:00 PM to 8:30 PM ET
- Saturday, September 6, from 2:00 PM to 3:30 PM ET

Module 2 Study Guide and Deliverables

(September 9 – September 15, 2025)

Module Topics: Principles of Protocols I; Basic Physical Layer; Ethernet and Other Media; Assembling Some Pieces; Access Control

Readings:

- Module 2 online content
- Tanenbaum book, Chapters 2, 3, & 4

Assignments:

- Quiz 2 due **Wednesday, September 17, at 6:00 AM ET**
- Assignment 2 due **Wednesday, September 17, at 6:00 AM ET**

Live Classrooms:

- Wednesday, September 10, from 7:00 PM to 8:30 PM ET
- Saturday, September 13, from 2:00 PM to 3:30 PM ET

Module 3 Study Guide and Deliverables

(September 16 – September 22, 2025)

Module Topics: Considering Multiple Systems; Multiple Systems with Relays; Routing and Relaying; The Network Layer; Naming and Addressing

Readings:

- Module 3 online content
- Tanenbaum book, Chapter 5

Assignments:

- Quiz 3 due **Wednesday, September 24, at 6:00 AM ET**
- Assignment 3 due **Wednesday, September 24, at 6:00 AM ET**
- Project outline due **Wednesday, September 24 at 6:00 AM ET**

Live Classrooms:

- Wednesday, September 17, from 7:00 PM to 8:30 PM ET
- Saturday, September 20, from 2:00 PM to 3:30 PM ET

Module 4 Study Guide and Deliverables

(September 23 – September 29, 2025)

Module Topics: “End-to-End” Error Control; TCP/IP and the Internet; Traffic Management; Congestion Control

Readings:

- Module 4 online content
- Tanenbaum book, Chapter 6 (except 6.4.2 & 6.4.3)

Assignments:

- Quiz 4 due **Wednesday, October 1, at 6:00 AM ET**
- Assignment 4 due **Wednesday, October 1, at 6:00 AM ET**

Live Classrooms:

- Wednesday, September 24, from 7:00 PM to 8:30 PM ET
- Saturday, September 27, from 2:00 PM to 3:30 PM ET

Module 5 Study Guide and Deliverables

(September 30 – October 6, 2025)

Module Topics: Network Infrastructure; How Networks Work; Name Resolution Systems; Current Applications

Readings:

- Module 5 online content
- Tanenbaum book, 5.6 in Chapter 5, 6.4.2 & 6.4.3 in Chapter 6 & Chapter 7

Assignments:

- Quiz 5 due **Wednesday, October 8, at 6:00 AM ET**
- Assignment 5 due **Wednesday, October 8, at 6:00 AM ET**

Live Classrooms:

- Wednesday, October 1, from 7:00 PM to 8:30 PM ET
- Saturday, October 4, from 2:00 PM to 3:30 PM ET

Module 6 Study Guide and Deliverables

(October 7 – October 13, 2025)

Module Topics: Security Mechanisms; Projects

Readings:

- Module 6 online content
- Tanenbaum book, Chapter 8

Assignments:

- Quiz 6 due **Wednesday, October 15, at 6:00 AM ET**
- Assignment 6 due **Wednesday, October 15, at 6:00 AM ET**

Live Classrooms:

- Wednesday, October 8, from 7:00 PM to 8:30 PM ET
- Saturday, October 11, from 2:00 PM to 3:30 PM ET

Course Evaluation:

Please complete the [course evaluation](#) once you receive an email or Blackboard notification indicating the evaluation is open. Your feedback is important to MET, as it helps us make improvements to the program and the course for future students.

Final Exam Details

The Final Exam is a proctored exam available from **Wednesday, October 15, 2025, at 6:00 AM ET to Saturday, October 18, 2025, at 11:59 PM ET.**

The Computer Science department requires that all final exams be administered using an online proctoring service, which you will access via your course in Blackboard. In order to take the exam, you are required to have a working computer, webcam, speakers, and microphone that meet the proctoring service's system requirements. A detailed list of those requirements can be found in the Proctored Exam Information module located on the course home page. Additional information regarding your proctored exam will be forthcoming from the Assessment Administrator. You will be responsible for scheduling your proctored exam session within the defined exam window.

The exam is accessible during the final exam period. You can access it from the Assessments section of the course. Your proctor will enter the password to start the exam.

Final Exam Duration: **3 hours**

The following materials can be used during the exam:

Grading Information

Grading Structure and Distribution

The final grade for the course will be determined as follows:

Overall Grading Percentages	
Assignments	20
Weekly Quizzes	10
Class Project	30
Proctored Final Exam	40

Graded Items:

- **Quizzes:**
 - Quizzes are designed to assess your understanding of the material, on a module-by-module basis. There is one graded quiz in each of the six modules.
 - The results for your quiz will be released after the questions are graded and reviewed. When the quiz results are released, you will be able to see the questions, your answers, and the correct answers.
- **Assignments:**
 - There are a total of six assignments. Assignments are assigned to get you to think about the concepts and develop a “feel for the issues.” Searching the Web for

answers, won't accomplish that.

- When naming your assignment file, follow the naming protocol "CS535_Assignment#_yourFirstnameLastname". Don't use spaces or "#" in file names. Add your name inside the file also.
- Late homework will be penalized as appropriate. You are encouraged to work together to learn the material and to discuss approaches to solving assignment problems. However, *you must come up with and write up the solutions on your own.*
- Nota Bene: The purpose of the homework is to help you ensure that you understand the material. Cutting and pasting answers from the Web may be quick and you may get a good grade, but it won't matter much if you haven't understood the material and don't score well on the exams. If it is found that you copied from Tanenbaum's answer manual or other blatant sources without citation, that homework will get a zero. If it happens a second time, it will be reported as plagiarism.

- **Class Project:**

- After we discuss the common structures in protocols and develop a general model of a layer, students should start planning their class project paper.
- For a project, one could take a protocol or group of protocols from the lower four layers or a relaying application protocol and apply this structure to it: Identify and document the mechanisms and policies in the protocol, what aspects are error and flow control, and what aspects are relaying and multiplexing. Does this protocol follow the structure outlined in class? If not, how does it differ, why does it differ, and should it? Does your example contradict the theory? Is the protocol wrong or is the theory wrong? If you choose a protocol that was discussed in class, then you must go well beyond what was covered, e.g., actually defining the policies that the protocol uses. The instructor will provide a list of the policies.
- Possible protocols: 802.11, SCTP, Bluetooth, X.25, HDLC, Ethernet and its LLCs, Mail, Transaction Processing, ATM, ISDN, MPLS, etc.
- Or you can work on a project of your interest. We do tend to discourage projects on security. Security may be your concentration, but there are courses on security, so save the idea for one of those. This is your chance to broaden your background and not be too narrow. That doesn't mean there aren't topics that could work for this class. Try them out and then discuss your idea with the instructor. Possible topics might include:
 - A specific application with unique properties: p2p, process control in an electric grid, a refinery or chemical plant, air traffic control, on-line trading, etc.
 - A specific aspect of networking: error detection/correction, flow control, security, multiplexing, re-transmission strategies, routing, congestion control, wireless protocol performance, distributed calculations, updating multiple copies, etc.
 - An area of networking relevant to your interests.

- The project paper should be about 10 pages (single-spaced).
- Project outline: At the end of Module 3, you are expected to submit a project outline. The outline is not graded. Within a week, the instructor will provide any feedback if necessary.
- **Proctored Final Exam:**
 - There will be a proctored Final Exam in this course using an online proctoring service. Detailed instructions regarding your proctored exam will be forthcoming from the Assessment Administrator. You will be responsible for scheduling your own appointment.

Ungraded Items:

- **Ungraded Discussion Board:**
 - There are ungraded discussion forums throughout the course, access at the “Discussions” tab on the top of the course menu. You are encouraged to ask course related questions, share your knowledge, and learn from your peers. Discussions forums are provided for your benefit. Some discussion forums involve the instructional staff; others are among students.
- **Live Classroom Sessions:**
 - Live Classroom sessions will be offered during this course in Modules 1 through 6. In each module, students have two Live Classroom sessions with the instructor. Days/times will be posted in the Study Guide.

Expectations

We recognize that emergencies occur in professional and personal lives. If one occurs that prevents your completion of homework by a deadline, please discuss with your instructor at your earliest convenience. This must be done in advance of the deadline (unless the emergency makes this impossible, of course), and should be accompanied by particulars that back it up. Additional documentation may be requested. Late submissions without reasons will result in grade deduction: 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.

Keys to Success in This (and Most Other) Course(s)

- **Do the readings!** Work out the examples as you read. If you do not believe that you completely understand something, try inventing and solving your own problems. If that doesn’t work, come see me and we will figure it out!
- **Take notes!** In particular, print out the course notes ahead of time and annotate them.
- **Participate!** Ask questions. Discuss with your fellow students. Be active.
- **Keep up!** Review and read over the notes from the previous class.
- **Allocate enough time!** Much of the material is time-consuming to master. There is a big difference between *kind of* understanding a subject and *really* understanding.

- **How do you know that you know the material?** A good metric is whether you would feel comfortable standing in front of a class explaining it. Another is whether you think that you could explain it to a job interviewer!

(Not So) Picky Things Your Instructor *REALLY* Cares About

- **Preparation.** Come to class prepared. If you haven't reviewed new terminology, etc., it makes it very difficult to follow what's going on. (The five Ps: Proper Preparation Prevents Poor Performance)
- **Participation.** The best way to learn is to be involved. Conversely, being distracted is the worst. This subject is really fascinating from a number of perspectives: scientific, historical, social, political, epistemological, etc. This stuff is fun.
- **Powers of 2.** Know them up to 2^{16} (at least) and why this is important.
- **Your success!** If you are having problems, arrange a conference with your instructor (and sooner rather than later).

Policy for the Use of Generative AI

Students should learn how to use AI text generators and other AI-based assistive resources (collectively, AI tools) to enhance rather than damage their developing abilities as writers, coders, communicators, and thinkers.

When using Generative AI in coursework, students shall:

1. Give credit to AI tools whenever used, even if only to generate ideas rather than usable text or illustrations.
2. When using AI tools on assignments, add an appendix showing (a) the entire exchange, highlighting the most relevant sections; (b) a description of precisely which AI tools were used (e.g. ChatGPT private subscription version or DALL-E free version), (c) an explanation of how the AI tools were used (e.g. to generate ideas, turns of phrase, elements of text, long stretches of text, lines of argument, pieces of evidence, maps of conceptual territory, illustrations of key concepts, etc.); (d) an account of why AI tools were used (e.g. to save time, to surmount writer's block, to stimulate thinking, to handle mounting stress, to clarify prose, to translate text, to experiment for fun, etc.).
3. Not use AI tools during in-class examinations, or assignments, unless explicitly permitted and instructed.
4. Employ AI detection tools and originality checks prior to submission, ensuring that their submitted work is not mistakenly flagged.
5. Use AI tools wisely and intelligently, aiming to deepen understanding of subject matter and to support learning.

For more details, please see the [Generative AI Assistance \(GAIA\) policy](#).

Course Policies and Academic Conduct

Academic Integrity: Plagiarism is the passing off of another's words or ideas as your own, and it is a serious academic offense. Plagiarism and cheating also defeat the purpose of getting an education. Plagiarism and cheating cases will be handled in accordance with the disciplinary procedures described in the College of Arts and Sciences Academic Conduct Code. You are expected to know and abide by the code, which can be read online: [Academic Conduct Code](#). Penalties range from failing an assignment or course (first offense) to suspension or expulsion from BU. If in doubt, cite your source. If you have any questions about academic integrity, please ask your instructor.

Incidents of academic misconduct will be reported to the Academic Conduct Committee (ACC). The ACC may suspend/expel students found guilty of misconduct.

Important Message on Final Exams

Dear Boston University Computer Science Online Student,

As part of our ongoing efforts to maintain the high academic standard of all Boston University programs, including our online MSCIS degree program, the Computer Science Department at Boston University's Metropolitan College requires that each of the online courses includes a proctored final examination.

By requiring proctored finals, we are ensuring the excellence and fairness of our program. The final exam is administered online.

Specific information regarding final-exam scheduling will be provided approximately two weeks into the course. This early notification is being given so that you will have enough time to plan for where you will take the final exam.

I know that you recognize the value of your Boston University degree and that you will support the efforts of the University to maintain the highest standards in our online degree program.

Thank you very much for your support with this important issue.

Regards,

Professor Lou Chitkushev, Ph.D.
Associate Dean for Academic Affairs
Boston University Metropolitan College

Who's Who: Roles and Responsibilities

You will meet many BU people in this course and program. Some of these people you will meet online, and some you will communicate with by email and telephone. There are many people behind the scenes, too, including instructional designers, faculty who assist with course preparation, and video and animation specialists.

People in Your Online Course in Addition to Your Fellow Students

Your Facilitator. Our classes are divided into small groups, and each group has its own facilitator. We carefully select and train our facilitators for their expertise in the subject matter and their excellence in teaching. Your facilitator is responsible for stimulating discussions in pedagogically useful areas, for answering your questions, and for grading homework assignments, discussions, term projects, and any manually graded quiz or final-exam questions. If you ask your facilitator a question by email, you should get a response within 24 hours, and usually faster. If you need a question answered urgently, post your question to one of the urgent help topics, where everyone can see it and answer it.

Your Professor. The professor for your course has primary responsibility for the course. If you have any questions that your facilitator doesn't answer quickly and to your satisfaction, then send your professor an email in the course, with a cc to your facilitator so that your facilitator is aware of your question and your professor's response.

Your Lead Faculty and Student Support Administrator, Rachel Regis. Rachel is here to ensure you have a positive online experience. You will receive emails and announcements from Rachel throughout the semester. Rachel represents Boston University's university services and works for BU Virtual. She prepares students for milestones such as course launch, final exams, and course evaluations. She is a resource to both students and faculty. For example, Rachel can direct your university questions and concerns to the appropriate party. She also handles general questions regarding Online Campus functionality for students, faculty, and facilitators, but she does not provide tech support. She is enrolled in all classes and can be contacted within the course through Online Campus email as it is running. You can also contact her by external email at bleug@bu.edu.

People Not in Your Online Course

Although you will not normally encounter the following people in your online course, they are central to the program. You may receive emails or phone calls from them, and you should feel free to contact them.

Your Computer Science Department Online Program Coordinator. The online program coordinator administers the academic aspects of the program, including admissions and registration. You can ask questions about the program, registration, course offerings, graduation, or any other program-related topic. The online program coordinator can be reached at metcsol@bu.edu or (617) 353-2566.

Your Computer Science Department Program Manager, Crystal Kelley. Crystal is responsible for administering most aspects of the Computer Science Department. You can reach Crystal at kelleycr@bu.edu or (617) 353-2566.

Andrew Gorlin, Academic Advisor. Reviews requests for transfer credits and waivers. Advises students on which courses to take to meet their career goals. You can reach Andrew at asgorlin@bu.edu, or (617)-353-2566.

Professor Guanglan Zhang, Computer Science Department Chairman. You can reach Professor Zhang at guanglan@bu.edu or at 617-358-2566.

Professor Lou T. Chitkushev, Associate Dean for Academic Affairs, Metropolitan College. Dr. Chitkushev is responsible for the academic programs of Metropolitan College. Contact Professor Chitkushev with any issues that you feel have not been addressed adequately. The customary issue-escalation sequence after your course facilitator and course faculty is Professor Temkin, and then Professor Chitkushev.

Professor Tanya Zlateva, Metropolitan College Dean. Dr. Zlateva is responsible for the quality of all the academic programs at Boston University Metropolitan College.

Disability and Access Services

In accordance with university policy, every effort will be made to accommodate students with respect to speech, hearing, vision, or other disabilities. Any student who may need an accommodation for a documented disability should contact [Disability and Access Services](#) at 617-353-3658 or at access@bu.edu for review and approval of accommodation requests.

Once a student receives their accommodation letter, they must send it to their instructor and/or facilitator each semester. They must also send a copy to their Faculty & Student Support Administrator, who may need to update the course settings to ensure accommodation is in place. Accommodation cannot be implemented if the students do not send their letters.