# MET CS 690 Online Course Syllabus (2026 Spring 1)
# Network and Cloud Security

## Instructor

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## Course Duration

Start: January 13, 2026; End: March 2, 2026

## Course Credit

4 credits

## Course Description

This course is designed to provide students with a comprehensive understanding of the fundamental concepts, principles, technologies, and best practices to secure both computer networks and clouds. Topics include an overview of network threats, SSL/TLS, Kerberos, PKI, IPsec, DNSsec, SSH, Firewall, IDS, VPD, electronic mail security, wireless network security, Blockchain, TOR, Cloud architecture, an overview of cloud threats, architecture protection and data protection in Cloud, IAM, security best practice, etc. Upon the completion of the course, students are expected to know the threats and vulnerabilities that networks and cloud systems face, along with the strategies and tools used to mitigate those risks. Hands-on labs based on existing tools are provided and required.

Prerequisites: MET CS535 or MET CS625 and MET CS695 or CY100

## Course Learning Objectives

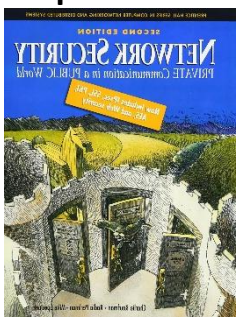
By successfully completing this course, you will be able to do the following:

1. Describe various attacks/threats against computer networks.
2. Describe the design of network protocols like IPsec, TLS, SSH, PKI, Kerberos, Shibboleth, DNSSEC, and identify their pros and cons.
3. Differentiate types of network defense mechanisms, design, as well as their applications, including firewall, IDS, etc., and tell their pros and cons.
4. Apply real world tools like Wireshark to capture network packets and firewall to protect internal networks from the outside.
5. Explain the demand and principles to implement anonymous communication and tell the design of TOR network.

6. Describe the fundamental concepts like characteristics, architecture, different models in cloud computing, explain the threats/attacks in cloud computing environments and the root causes of them.
7. Summarize the importance of data and architecture protection in cloud computing and detail/compare best security practices.
8. Configure security policies/procedures to safeguard cloud platforms.

## Course Materials

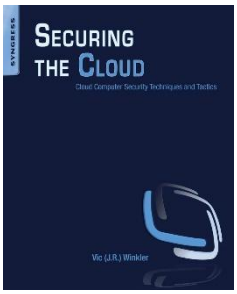
### Required Textbook




**Kaufman, C., Perlman, R., & Speciner, M. (2002). *Network Security: Private Communication in a Public World* (2nd ed.).**

Pearson/Prentice Hall
ISBN 9780130460196

The textbook can be purchased from Barnes & Noble at Boston University.




**Winkler, V. (J.R.) (2011). *Securing the Cloud: Cloud Computer Security Techniques and Tactics*.**

Syngress
ISBN 9781597495929

The book can also be purchased from Barnes & Noble at Boston University.

### Non-required Books and References

The following books are NOT required for this course. However, you will find they are valuable resources for anyone involved in the information security area.

- Dotson, C. (2023). *Practical Cloud Security: A Guide for Secure Design and Deployment* (2nd ed.). O'Reily Media. ISBN 9781098148171
- Du, W. (2022). *Computer Security: A Hands-on Approach* (3rd ed.). Independently Published. ISBN 9781733003957.
- Wang, J., & Kissel, Z. A. (2015). *Introduction to Network Security: Theory and Practice* (2nd ed.). Wiley. ISBN 9781118939482.

### Ubuntu Virtual Machine

The course has some lab exercises that require an Ubuntu virtual machine to be setup with the lab environment. Please visit the SEED lab site for more detail – https://seedsecuritylabs.org/.

### Microsoft Azure Dev Tools for Teaching

Microsoft Azure Dev Tools for Teaching is a Microsoft program that supports technical education by providing access to Microsoft software for learning, teaching, and research purposes. Our membership allows faculty and students currently enrolled in MET courses to obtain certain Microsoft products free of charge. All MET students are granted access to download the software for the duration of their study at MET College.

FAQ and basic information are at Microsoft Azure Dev Tools for Teaching, (You may have to enter your personal BU login credentials to access this page.)

## Study Guide and Timeline of Deliverables

This course starts on a **Tuesday** and is organized around seven weeks. The last week is reserved for the final exam so we will have six weeks to cover the material. The material is presented as modules, each module containing a set of related topics. The modules in this course run from **Tuesday to Monday**.

## Module 1 Study Guide and Deliverables

(January 13 – January 19, 2026)

### Module Topics:

Review Cybersecurity Fundamentals and Overview Network Threats/Attacks

### Readings:

- Module 1 online content
- Network Security: *Private Communication in a Public World* textbook:
  - Chapter 1.5 – 1.8 and 1.12
  - Chapter 2
  - Chapter 6.4 - 6.5

### Self Assessment:

Crediting Sources Tutorial Self-Assessment due **Tuesday, January 20 at 6:00 AM ET**

### Discussions:

Self introduction discussion postings end **Tuesday, January 20, at 6:00 AM ET**

### Labs/Assignments:

- **Lab 1** due **Tuesday, January 20 at 6:00 AM ET**

### Assessments:

- **Quiz 1** due **Tuesday, January 20 at 6:00 AM ET**

### Live Classrooms:

- **Tuesday, January 13, from 7:00 PM to 9:00 PM ET**

  Note: In one of the live classroom sessions, the instructor will walk through and review Lab Exercises instructions. Lab Exercise #2 and Lab Exercise #3 will come from the Hands-on Labs for Security Education (SEED Labs). Detailed directions will be available later.

### Live Office Hours:

- Saturday, January 17, from 8:00 PM to 8:30 PM ET

## Module 2 Study Guide and Deliverables

(January 20 – January 26, 2026)

**Module Topics: Authentication Protocols:** PKI, Kerberos, Shibboleth, DNSSEC

### Readings:

- Module 2 online content
- Network Security: *Private Communication in a Public World* textbook:
  - Chapter 9.7 – 9.9
  - Chapter 13.1 – 13.7
  - Chapter 15.1 and 15.4

### Labs/Assignments:

- **Lab 2** due **Tuesday, January 27 at 6:00 AM ET**
- **Assignment 1** due **Tuesday, January 27 at 6:00 AM ET**

### Assessments:

- **Quiz 2** due **Tuesday, January 27 at 6:00 AM ET**

### Live Classrooms:

- **Tuesday, January 20, from 7:00 PM to 9:00 PM ET**

### Live Office Hours:

- Saturday, January 24, from 8:00 PM to 8:30 PM ET

## Module 3 Study Guide and Deliverables

(January 27 – February 2, 2026)

**Module Topics: Protect Internal Networks and End to End Secure Communication**

### Readings:

- Module 3 online content
- Network Security: *Private Communication in a Public World* textbook:

  - Chapter 17
  - Chapter 18.1 – 18.4
  - Chapter 19.1 – 19.12
- *Introduction to Network Security Theory and Practice* textbook:
  - Chapter 8
  - Chapter 9

### Discussions:

- **Discussion 1** due **Tuesday, February 3 at 6:00 AM ET**
- Students are expected to create at least one new discussion thread and post at least one comment to threads created by other students.

### Labs/Assignments:

- **Lab 3 Part 1** due **Tuesday, February 3 at 6:00 AM ET**

### Assessments:

- **Quiz 3** due **Tuesday, February 3 at 6:00 AM ET**

### Live Classrooms:

- **Tuesday, January 27, from 7:00 PM to 9:00 PM ET**

### Live Office Hours:

- Saturday, January 31, from 8:00 PM to 8:30 PM ET
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## Module 4 Study Guide and Deliverables

(February 3 – February 9, 2026)

### Module Topics: Advanced Topics: Anonymous Networks, Email Security and Wireless Network Security

### Readings:

- Module 4 online content
- *Network Security: Private Communication in a Public World* textbook:
  - Chapter 20.1 – 20.13
- *Introduction to Network Security Theory and Practice* textbook:
  - Chapter 6.1 and 6.2
- The Dark Web Browser: What Is Tor, Is it Safe, and How Do You Use It?

### Labs/Assignments:

- **Assignment 2** due **Tuesday, February 10 at 6:00 AM ET**
- **Lab 3 Part 2** due **Tuesday, February 10 at 6:00 AM ET**

### Assessments:

- **Quiz 4** due **Tuesday, February 10 at 6:00 AM ET**

### Live Classrooms:

- **Tuesday, February 3, from 7:00 PM to 9:00 PM ET**

### Live Office Hours:

- Saturday, February 7, from 8:00 PM to 8:30 PM ET
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## Module 5 Study Guide and Deliverables

(February 10 – February 16, 2026)

### Module Topics: Cloud Security (1)

### Readings:

- Module 5 online content
- *Securing the Cloud: Cloud Computer Security Techniques and Tactics* textbook:
  - Chapter 2
  - Chapter 3
- Hey, you, get off of my cloud: exploring information leakage in third-party compute clouds

### Discussions:

- **Discussion 2** due **Tuesday, February 17 at 6:00 AM ET**

### Labs/Assignments:

- **Assignment 3** due **Tuesday, February 17 at 6:00 AM ET**

### Assessments:

- **Quiz 5** due **Tuesday, February 17 at 6:00 AM ET**

### Live Classrooms:

- **Tuesday, February 10, from 7:00 PM to 9:00 PM ET**

### Live Office Hours:

- Saturday, February 14, from 8:00 PM to 8:30 PM ET

# Module 6 Study Guide and Deliverables

(February 17 – February 23, 2026)

## Module Topics: Cloud Security (2)

## Readings:

- Module 6 online content
- *Securing the Cloud: Cloud Computer Security Techniques and Tactics* textbook:
  - Chapter 4
  - Chapter 5
  - Chapter 6

## Labs/Assignments:

- **Lab 4** due **Tuesday, February 24 at 6:00 AM ET**

## Assessments:

- **Quiz 6** due **Tuesday, February 24 at 6:00 AM ET**

## Live Classrooms:

- **Tuesday, February 17, from 7:00 PM to 9:00 PM ET**

## Final Exam Review:

- Saturday, February 21, from 8:00 PM to 8:30 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, February 25, 2026, at 6:00 AM ET to Saturday, February 28, 2026, at 11:59 PM ET**.

The Computer Science department requires that all final exams be administered using an online proctoring service that you will access via your course in Blackboard. In order to take the exam, you are required to have a working webcam and computer that meets the exam proctoring service's system requirements. A detailed list of those requirements can be found on the How to Schedule page. Detailed instructions regarding your proctored exam will be forthcoming from the Assessment Administrator. **You will be responsible for scheduling your own appointment within the defined exam window.**

The exam is accessible during the final exam period. Your proctor will enter the password to start the exam.

Final Exam Duration: **3 hours**

## Grading Information

### Class Expectations

You will have to complete homework assignments to help you master the material. You will also have to read the textbooks and be ready to discuss the content related to the current class topics.

1. Assignment, Lab Exercise, and Discussion Completion & Late Work
   - Homework assignments are mandatory, must be completed and submitted in a timely manner, and are required to be submitted via the course site for this course. If a student will be unable to submit an assignment by its due date, the student must contact the Instructor or Facilitator **in advance** to avoid a grade of zero (0) on the submitted material.
   - Lab exercises are mandatory, must be completed and submitted in a timely manner, and are required to be submitted via the course site for this course. If a student will be unable to submit a lab exercise by its due date, the student must contact the Instructor or Facilitator **in advance** to avoid a grade of zero (0) on the submitted material.
   - Student postings to discussion topics after the listed closing dates will not be counted when calculating a student's discussion grades.
2. Academic Conduct Code – Cheating and plagiarism will not be tolerated in any Metropolitan College course. Such activities/behavior will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take the time to review the Student Academic Conduct Code. Such activities/behavior include copying (even with modifications) of another student's work or allowing your work to be copied. Your participation in interactions with the instructor and your classmates is encouraged, but the work you submit must be your own. Collaboration is not permitted.

### Basis for Grades

There are four components to your grades.

- **Assignments:**
  - All homework assignments are identified within the course site in the Study Guides.
  - File names for assignment documents should be:
    - CS690-HW<number>-<student last name>.doc
      An example assignment document file name is: CS690-HW1-Heister.doc
  - Student assignment submissions must be no more than 4 pages in length, be single spaced, use 12 point Times Roman font, and have 1" margins on all sides.

    - Note: Student submissions which fail to follow this direction will have 5 points deducted!
  - Title cover pages are not required and should not be used;
  - Quoted material and citations must follow the American Psychological Association (APA) format with a reference section at the end of a student's submitted work. Please refer to the APA Style web site for guidance on following the APA style guide.
  - Failure to cite the works of others used in your submission is considered plagiarism and violates the BU Academic Conduct Policy.
  - Wikipedia is a useful starting point for finding information about a subject BUT NOT an acceptable direct reference source. One should only reference or quote from primary (source) documents.
  - Submit each assignment inside the module.

- **Lab Exercises:**
  - Lab exercises are identified within the Assignment description document for some modules. The first three labs are based on SEED lab which requires an Ubuntu virtual machine to be setup with the lab environment. Please visit the SEED lab site for more detail – SEED Security Labs.
  - File names for lab exercise documents should be:
    CS690-LAB<number>-<student last name>.doc
    An example lab exercise document file name is:
    CS690-LAB5-Heister.doc
  - Students should enter their lab exercise answers directly within each lab exercise document and then submit the completed document appropriately renamed as stated above.
  - Submit each lab inside the module.

- **Discussion Threads**
  - Module 3 and Module 5 each includes a discussion topic that students are required to participate in.
  - Students are expected to participate in each module discussion activity which requires the student to make one or two primary, and multiple follow-up posts to other students' primary posts. A primary post is one where the student introduces a new thread topic. A follow-up post is one which replies to another student's primary post.
  - Each posting should be original and add value to the discussion.
  - The quality of each post is far more important than the quantity of posts.
  - Participate in the discussions inside the module.
  - Facilitators will use the following rubric to assign a subjective grade to each student discussion post.

| Criteria | Poor | Fair | Good | Very Good | Excellent |
|---|---|---|---|---|---|
| **Participation** | Very limited participation | Participation generally lacks frequency or relevance | Reasonably useful relevant participation during the discussion period | Frequently relevant and consistent participation throughout the discussion period | Continually relevant and consistent participation throughout the discussion period |
| **Community** | Mostly indifferent to discussion | Little effort to keep discussions going or provide help | Reasonable effort to respond thoughtfully, provide help, and/or keep discussions going | Often responds thoughtfully in a way that frequently keeps discussions going and provides help | Continually responds thoughtfully in a way that consistently keeps discussions going and provides help |
| **Content** | No useful, on-topic, or interesting information, ideas or analysis | Hardly any useful, on-topic, or interesting information, ideas or analysis | Reasonably useful, on-topic, and interesting information, ideas and/or analysis | Frequently useful, on-topic, and interesting information, ideas and analysis | Exceptionally useful, on-topic, and interesting information, ideas and analysis |
| **Reflection and Synthesis** | | | No significant effort to clarify, summarize, or synthesize topics raised in discussions | Contributes to group's effort to clarify, summarize, or synthesize topics raised in discussions | Leads group's effort to clarify, summarize, or synthesize topics raised in discussions |

- **Quizzes:**
  - Students are required to take six online quizzes (one per module) while the course is running. Students will be allowed 90 minutes to complete each quiz. A student may take each of these quizzes starting when a quiz becomes available on the course page.
  - Each quiz will close at 6 AM ET on the date the next module starts and will not be reopened except for unusual circumstances as decided by the instructor. If a student cannot complete a quiz during the week the quiz is available, the student must make prior arrangements with the instructor.
  - Complete each quiz inside the module.

- **Proctored Final Exam:**
  - There will be a three-hour proctored final exam.
  - Complete the final exam in the "Module 7 – Proctored Final Exam" module.

## Grade Computations

The course grade will be computed from the following:

| Graded Items | Percentage of Grade |
|---|---|
| Written Assignments | 15% |
| Quizzes | 18% |
| Discussion and Participation | 5% |
| Lab Exercises | 32% |
| Proctored Final Exam | 30% |
| Total | 100% |

Grade ranges are as follows:

- 93 <= is an A
- 90 <= and < 93 is an A-
- 85 <= and < 90 is a B+
- 80 <= and < 85 is a B
- 77 <= and < 80 is a B-
- 74 <= and < 77 is a C+
- 70 <= and < 74 is a C
- < 70 is an F

## Ungraded Items

- ### Ungraded Discussion Forums:

  There are ungraded discussion forums throughout the course. You are encouraged to share your knowledge and learn from your peers. Discussion forums are provided for your benefit. Some discussion forums involve the instructional staff; others are among students.

- ### Live Classroom Sessions:

  There will be weekly live classroom session conducted by your instructor.

  During these online sessions the instructor will present and clarify material from the week's readings, as well as answer students' questions. Attendance is not required at these sessions but is highly recommended. All on-line sessions will be recorded and archived. The archived recordings will be accessible from the left-hand course menu "Live Classroom Recordings".

### 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 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

## 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.