Syllabus

This is a single, concatenated file, suitable for printing or saving as a PDF for offline viewing. Please note that some animations or images may not work.

Course Description

This module is also available as a concatenated page, suitable for printing or saving as a PDF for offline viewing.

MET CS695

Cybersecurity

This course introduces fundamental concepts, principles of cybersecurity and their use in the development of security mechanisms and policies. Topics include basic risk assessment and management; basic legal and ethics issues, various cyber attacks, defense methods and tools; security principles, models and components; different crypto protocols, techniques and tools, including symmetric and asymmetric encryption algorithms, hashing, public key infrastructure, and how they can be used; security threats and defense to hardware, operating systems, networks and applications in modern computing environments. Hands-on labs using current tools are provided and required.

Prerequisites

MET CS 535 or MET CS 625, or with in advance permission of the instructor.

Technical Notes

The table of contents expands and contracts (+/- sign) and may conceal some pages. To avoid missing content pages, you are advised to use the next/previous page icons in the top right corner of the learning modules.

This course requires you to access files such as word documents, PDFs, and/or media files. These files may open in your browser or be downloaded as files, depending on the settings of your browser.

Course Learning Objectives

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

- Explain the fundamental concepts of the cyber security discipline.
- Describe basic risk assessment and management.
- Describe basic elements of a cryptographic system, and how crypto can be used.
- Identify strengths and weaknesses, modes, implementation issues and applications of different crypto protocols, techniques and tools including symmetric and asymmetric algorithms, encryption and hashing, PKI, etc.
- Identify potential cyber attacks, as well as cyber defense tools, methods and components to repel attacks.
- Describe appropriate measures to be taken should a system compromise occur.
- Properly use the vocabulary associated with cyber security
- Explain principles of cybersecurity and how they should be applied in the development of security mechanisms and policies
- Describe the security implications of various components in a computer system such as, hardware, OS, applications, network, and the user.
- Describe the security implications of the emerging technologies such as mobile and IoT.

Course Outline

Module 1: Introduction to Cybersecurity

- Basic concepts and terminology in cybersecurity
    - Motivation to study cybersecurity, real world examples of cyberattacks.
    - Branches of cybersecurity
    - Basic concepts: CIA, vulnerability, threat, risk, attack, compromise, control
- Legal issues and ethics,
- Risk analysis and security management

Module 2: Attacks and Defense

- Malware: virus, worms, trojan horse, rootkit, zombie, bot, botnet, ransomware,
- Bug: buffer overflow, integer overflow, TOCTTOU, covert channel
- Security model: threat model, trust model, trusted computing base
- Security principles and countermeasures

Module 3: Introduction to Crypto

- The role and property of crypto
- Terminology: Alice, Bob, Eve, encrypt, decrypt, cryptography, cryptanalysis
- Classical encryption: Caesar Cipher, ROTx, substitution cipher
- Symmetric encryption: DES, AES
- Key negotiation: DH
- Asymmetric encryption: RSA
- Hash: MD, MAC, HMAC
- Data authenticity and confidentiality

Module 4: Authentication and Authorization

- Something you know, you are, and you have: password, biometrics, token.
- Digital signature and Kerberos
- Digital certificate and PKI
- Access policy, access control matrix, access control list, capability, RBAC

Module 5: Network Security and Web Security

- Threats to network: data interception, replay attack, port scanning, DoS, DDoS, MITM
- Network defense: IPsec, VPN, Firewalls
- Browser attacks, email attacks, misleading/malicious web content

Module 6: Cyber System Security

- Hardware security: meltdown, spectre, TEE.
- Virtualization and Cloud computing security
- Mobile security and IoT security

Module 7 - Prepare for and take the final exam

- You will prepare for and take the proctored final exam.

The course will remain open two weeks after the final exam, so that you can continue discussions and ask any questions about database technology, your grades or the course. This is also a time when we enter into a dialog where we endeavor to learn from you how we can modify the course so that it better meets your needs.

Instructor

Niklos See

Computer Science Department
Metropolitan College
Boston University

Email: nsee@bu.edu

Nicklos See has taught programming, Information Technology, and cybersecurity classes over 25 years. He holds numerous certifications in areas such as networking, operating systems, and security. Holding a Master's degree in Computer Information Systems, with a security concentration, Nick enjoys bringing a knowledge of computing to his students.

Course Developers

Sengzhi Zhang, Ph.D

Computer Science Department
Metropolitan College
Boston University

Email: shengzhi@bu.edu

Dr. Shengzhi Zhang earned his PhD in Computer Science and Engineering from Penn State University in 2012. His research focuses on cybersecurity, including but not limited to Internet of Things (IoT) security, automobile security, mobile security, and operating system security, among others. He has most recently worked as an assistant professor in the Department of Computer Science at the Florida Institute of Technology. Prior to academia, Dr. Zhang conducted various research projects in Cisco, IBM, and Honeywell Aerospace labs. His existing partnerships, both nationally and internationally, include researchers from Ford Motor, IBM, GE, Indiana University, Penn State, Kuwait University, and the Chinese Academy of Sciences. Dr. Zhang has published many papers and served as program committee members in top-tier security

conferences and journals.

Another Course Developers

Yuting Zhang, Ph.D

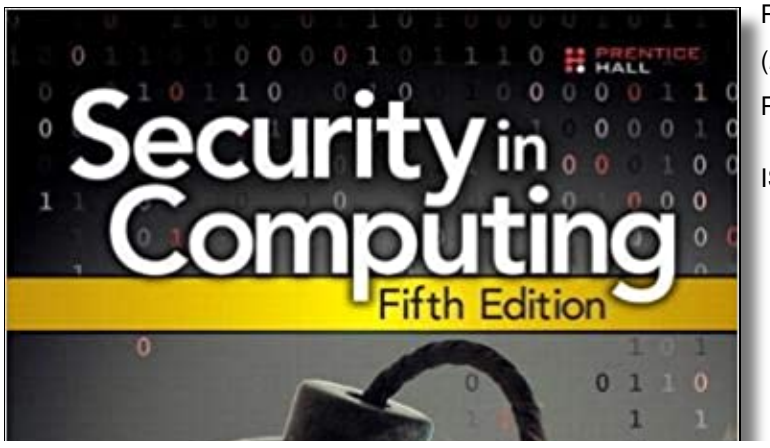
Assistant Professor, Computer Science; Coordinator, Information Security
Metropolitan College
Boston University
PhD, Boston University MS, BS, University of Science and Technology Beijing

Email: danazh@bu.edu

Dr. Zhang's research mainly focuses on resource management in soft real-time systems, virtual machine systems, and internet end-systems, though her interest spreads to all areas of computer systems and networks. Conducted through both theoretic analysis and empirical evaluation, her research has been published in more than a dozen conference proceedings and journals. Zhang served as an assistant professor at Merrimack College, the Wentworth Institute of Technology, Allegheny College, and the University of Science and Technology Beijing. She has taught a variety of courses, including information technology, Java/C++/C programming, operating systems, computer networks, analysis of algorithms, software engineering, programming languages, and a research seminar.

Course Materials

Required Book



Pfleeger, C. P., Pfleeger, S. L., & Margulies, J. (2015). Security in Computing (5th ed.). Pearson/Prentice Hall.

ISBN 9780134085043.

Physical copies of the textbook are sold at Barnes and Noble at Boston University. An e-book is available at Vitalsource.com. An e-book is available through Amazon. An e-book is available through the BU bookstore.

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:

met_ode_library_14_sp1_00_intro video cannot be displayed here. Videos cannot be played from Printable Lectures. Please view media in the module.

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.

Journals & conferences/proceedings in Information Security

- Computer Security Update
- European Conference on Information Warfare and Security
- IEEE Transactions on Dependable and Secure Computing
- Information Security Journal
- Information Security Management Principles
- Inside Cybersecurity
- International Conference on Information Warfare and Security
- International Journal of Computer Science and Information Security
- International Journal of Information Security
- Journal of Information Privacy & Security
- SC Magazine

Portals

- ACM Digital Library
- Proceedings of the IEEE

Additional links for searching

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 Collections to access eBooks and eJournals directly.

If you have questions about library resources, go to Ask a Librarian: Help & FAQs to email the library or use the live-chat feature.

To locate course eReserves, go to 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.

Free Tutoring Service

Free online tutoring services by Tutor.com are available to BU online students for the duration of their eligible online course. Tutor.com is a web-based service that provides an online writing lab and access to on-demand and scheduled tutoring sessions for writing, math, business, coding languages, and other subjects. Students can submit a question to a tutor, submit a paper for feedback about writing and grammar, or schedule a live session with a tutor.

You can log in directly to Tutor.com from Blackboard Online Campus by clicking the link in the left-hand navigation menu within your online course. All activity in the Tutor.com classroom is recorded for learner review and quality control. Transcripts will be available afterward in My Account under My Locker in your Tutor.com account.

Please Note

Tutor.com services may be used only for current Boston University online courses and career services. Use of this service for purposes other than current coursework or career services may result in deactivation of your Tutor.com account.

Study Guide

This course starts on a **Tuesday**. The modules in this course run from **Tuesday to Monday**.

Module 1 Study Guide and Deliverables

January 14 – January 20

Theme:	Introduction to Cybersecurity

Topics:	• Basic concepts and terminology in cybersecurity
	  ◦ Motivation to study cybersecurity, real world examples of cyberattacks.
	  ◦ Branches of cybersecurity
	  ◦ Basic concepts: CIA, vulnerability, threat, risk, attack, compromise, control
	• Legal issues and ethics,
	• Risk analysis and security management

Readings:	• Chapter 1, Chapter 10.1 - 10.4, Chapter 11.1, Chapter 11.5 – 11.6
Assignments:	• Lab 1 due **Tuesday, January 21 at 6:00 AM ET** (Access at "Assignments"

	on the left-hand course menu.)
Assessments:	• Quiz 1 due **Tuesday, January 21 at 6:00 AM ET** (Access at "Assessments" on the left-hand course menu.)
Discussions:	• Discussion 1 posts due **Tuesday, January 21 at 6:00 AM ET**. Any posts after the due time will not be included in the grading process. (Access at "My Group" on the left-hand course menu.)
Live Classroom:	Join the live classroom and the facilitator's live office hour session at "Live Classroom/Offices" > "Live Classroom" > Launch Meeting. • Lecture: **Tuesday, January 14 , 7:30-9:00 PM ET** • Facilitator office hour: TBD

Module 2 Study Guide and Deliverables

January 21 – January 28

Theme:	Attacks and Defense
Topics:	• Malware: virus, worms, trojan horse, rootkit, zombie, bot, botnet, ransomware, • Bug: buffer overflow, integer overflow, TOCTTOU, covert channel • Security model: threat model, trust model, trusted computing base • Security principles and countermeasures
Readings:	• Chapter 3
Assignments:	• Assignment 1 due **Tuesday, January 28 at 6:00 AM ET** • Lab 2 due **Tuesday, January 28 at 6:00 AM ET** Access at "Assignments" on the left-hand course menu.
Assessments:	• Quiz 2 due **Tuesday, January 28 at 6:00 AM ET** (Access at "Assessments" on the left-hand course menu.)
Discussions:	• None
Live Classroom:	Join the live classroom and the facilitator's live office hour session at "Live Classroom/Offices" > "Live Classroom" > Launch Meeting. • Lecture: **Tuesday, January 21, 7:30-9:00 PM ET** • Facilitator office hour: TBD

Module 3 Study Guide and Deliverables

January 28 – February 3

Theme:	Introduction to Crypto
Topics:	• The role and property of crypto • Terminology: Alice, Bob, Eve, encrypt, decrypt, cryptography, cryptanalysis • Classical encryption: Caesar Cipher, ROTx, substitution cipher • Symmetric encryption: DES, AES • Key negotiation: DH • Asymmetric encryption: RSA • Hash: MD, MAC, HMAC

	• Data authenticity and confidentiality
Readings:	• Chapter 2.3. • Extra reading: Chapter 12.1 – 12.5
Assignments:	• Lab 3 due **Tuesday, February 4 at 6:00 AM ET** (Access at "Assignments" on the left-hand course menu.)
Assessments:	• Quiz 3 due **Tuesday, February 4 at 6:00 AM ET** (Access at "Assessments" on the left-hand course menu.)
Discussions:	• None
Live Classroom:	Join the live classroom and the facilitator's live office hour session at "Live Classroom/Offices" > "Live Classroom" > Launch Meeting. • Lecture: **Tuesday, January 28, 7:30-9:00 PM ET** • Facilitator office hour: TBD

Module 4 Study Guide and Deliverables

February 4 – February 10

Theme:	Authentication and Authorization
Topics:	• Something you know, you are, and you have: password, biometrics, token. • Digital signature and Kerberos • Digital certificate and PKI • Access policy, access control matrix, access control list, capability, RBAC
Readings:	• Chapter 2.1 and Chapter 2.2
Assignments:	• Assignment 2 due **Tuesday, February 11 at 6:00 AM ET** • Lab 4 due **Tuesday, February 11 at 6:00 AM ET**
Assessments:	• Quiz 4 due **Tuesday, February 11 at 6:00 AM ET**
Discussions:	• Discussion 2 posts due **Tuesday, February 11 at 6:00 AM ET**. Any posts after the due time will not be included in the grading process.
Live Classrooms:	• Lecture: **Tuesday, February 4, 7:30-9:00 PM ET** • Facilitator office hour: TBD

Module 5 Study Guide and Deliverables

February 11 – February 17

Theme:	Network Security and Web Security
Topics:	• Threats to network: data interception, replay attack, port scanning, DoS, DDoS, MITM • Network defense: IPsec, VPN, Firewalls • Browser attacks, email attacks, misleading/malicious web content
Readings:	• Chapter 6.1 – 6.2, Chapter 6.4 – 6.5, Chapter 6.7, Chapter 4.1 – 4.3
Assignments:	• Lab 5 due **Tuesday, February 18 at 6:00 AM ET**
Assessments:	• Quiz 5 due **Tuesday, February 18 at 6:00 AM ET**
Discussions:	• Discussion 3 posts due **Tuesday, February 18 at 6:00 AM ET**. Any posts after the due time will not be included in the grading process.

Live Classrooms:	• Lecture: **Tuesday, February 11, 7:30-9:00 PM ET** • Facilitator office hour: TBD

Module 6 Study Guide and Deliverables

February 18 – February 24

Theme:	Cyber System Security
Topics:	• Hardware security: meltdown, spectre, TEE • Virtualization and Cloud computing security • Mobile security and IoT security
Readings:	• Chapter 8.1 – 8.4, Chapter 4.4, Chapter 13.1
Assignments:	• Assignment 3 due **Tuesday, February 25 at 6:00 AM ET**
Assessments:	• Quiz 6 due **Tuesday, February 25 at 6:00 AM ET**
Discussions:	• None
Live Classrooms:	• Lecture: **Monday, February 18, 7:30-9:00 PM ET** • Facilitator office hour: TBD
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 26 at 6:00 AM ET to Saturday, March 1 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. 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 Final Exam will be **open book/open notes** and 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.

The following materials are allowed to use during the final exam:

- Use of the physical and/or ebook textbook.
- Use of any printed materials.
- Use of three pieces of blank scratch paper.

Final Exam Duration: **3 hours**.

Course Grading Information

It is important for each student to participate on a regular basis and complete all aspects of this course. This course is designed to include a major portion of learning by interacting (asynchronously) with the other students in the class, and the grade is therefore dependent on this activity. Course quizzes are cumulative in what they cover. This means that a quiz may include questions on material from prior modules.

Grading Structure and Distribution

The following tables depict how final grades will be calculated. Only exceptions necessary to maintain academic standards will be allowed.

Overall Grading Percentages	
Homework assignments	15
Quizzes	18
Lab exercises	25
Discussion and class participation	12
Proctored final exam	30

Grading Scale	
A	≥ 93
A-	90 ≤ and < 93

B+	85 ≤ and < 90
B	80 ≤ and < 85
B-	77 ≤ and < 80
C+	74 ≤ and < 77
C	70 ≤ and < 74
C-	65 ≤ and < 70
D	60 ≤ and < 65
F	≤ 60

Homework Assignments and Lab Exercises

- There are 3 homework assignments and 5 lab exercises. Both homework assignments and lab exercises are mandatory, must be completed and submitted in a timely manner, and are required to be submitted via Online Campus for this course;
- Each assignment, including lab, quiz, discussion, etc., has a deadline. All assignments are assessed a 33% per-day late penalty, up to a maximum of 3 days. No assignments will be accepted four days after the deadline. Students with legitimate reasons who contact the professor before the deadline may apply for extension.
- All homework assignments or lab exercises are identified within the Online campus Study Guide.
- File names for assignment documents should be:

  CS695-HW<number>-<student last name>.doc

  An example assignment document file name is:

  CS695-HW5-Jacobs.doc

- File names for lab exercise documents should be:

  CS695-LAB<number>-<student last name>.doc

  An example lab exercise document file name is:

  CS695-LAB5-Jacobs.doc

- Include your name and assignment number in the header and a page number in the footer of you assignment submission document.
- Assignment submission documents MUST be in Word format with the file extension .doc, rather than .docx.
- 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 Formatting and Style

Guide web site for guidance on following the APA style guide.

- 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.

Quizzes

There will be six quizzes, one per every module. The purpose of quizzes is to help students practice and keep current with the course material.

Discussions

tudents will be participating in three graded discussions, one for Module 1, Module 4, and Module 5. The purpose of the discussions is to help students reflect, synthesize, do further research, and make connections between what you have learned and real world applications. Exchanging thoughts among students will help you learn from your peers. Check out the Discussion Rubric.

Final Exam

There will be a proctored Final Exam in this course. Detailed instructions regarding your proctored exam will be forthcoming from the Assessment Administrator. You will be responsible for scheduling your own appointment.

Delays

In the case of serious or emergency situations, or if, for any reason, you are unable to meet any assignment deadline, contact your instructor.

Discussion Grading Rubric

Graded discussion periods are held Day 1 of each module until 6:00 AM ET on Day 1 of the following module. You're certainly welcome to continue a discussion past the grading period, but that additional posted material will not affect your discussion grade. The discussion grading rubric below is the guide we use to evaluate your discussion contributions.

Discussion Grading Rubric

Criteria	51–60	61–70	71–80	81–90	91–100
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 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

Academic Conduct Policy

Please visit Metropolitan College's website for the full text of the department's *Academic Conduct Code*.

A Definition of Plagiarism

> “The academic counterpart of the bank embezzler and of the manufacturer who mislabels products is the plagiarist: the student or scholar who leads readers to believe that what they are reading is the original work of the writer when it is not. If it could be assumed that the distinction between plagiarism and honest use of sources is perfectly clear in everyone’s mind, there would be no need for the explanation that follows; merely the warning with which this definition concludes would be enough. But it is apparent that sometimes people of goodwill draw the suspicion of guilt upon themselves (and, indeed, are guilty) simply because they are not aware of the illegitimacy of certain kinds of “borrowing” and of the procedures for correct identification of materials other than those gained through independent research and reflection.”
>
> “The spectrum is a wide one. At one end there is a word-for-word copying of another’s writing without enclosing the copied passage in quotation marks and identifying it in a footnote, both of which are necessary. (This includes, of course, the copying of all or any part of another student’s paper.) It hardly seems possible that anyone of college age or more could do that without clear intent to deceive. At the other end there is the almost casual slipping in of a particularly apt term which one has come across in reading and which so aptly expresses one’s opinion that one is tempted to make it personal property.”
>
> “Between these poles there are degrees and degrees, but they may be roughly placed in two groups. Close to outright and blatant deceit-but more the result, perhaps, of laziness than of bad intent-is the patching together of random jottings made in the course of reading, generally without careful identification of their source, and then woven into the text, so that the result is a mosaic of other people’s ideas and words, the writer’s sole contribution being the cement to hold the pieces together. Indicative of more effort and, for that reason, somewhat closer to honest, though still dishonest, is the paraphrase, and abbreviated (and often skillfully prepared) restatement of someone else’s analysis or conclusion, without acknowledgment that another person’s text has been the basis for the recapitulation.”

The paragraphs above are from H. Martin and R. Ohmann, *The Logic and Rhetoric of Exposition, Revised Edition.*

Academic Conduct Code

I. **Philosophy of Discipline**

The objective of Boston University in enforcing academic rules is to promote a community atmosphere in which learning can best take place. Such an atmosphere can be maintained only so long as every student believes that his or her academic competence is being judged fairly and that he or she will not be put at a disadvantage because of someone else’s dishonesty. Penalties should be carefully determined so as to be no more and no less than required to maintain the desired atmosphere. In defining violations of this code,

the intent is to protect the integrity of the educational process.

II. **Academic Misconduct**

Academic misconduct is conduct by which a student misrepresents his or her academic accomplishments, or impedes other students' opportunities of being judged fairly for their academic work. Knowingly allowing others to represent your work as their own is as serious an offense as submitting another's work as your own.

III. **Violations of this Code**

Violations of this code comprise attempts to be dishonest or deceptive in the performance of academic work in or out of the classroom, alterations of academic records, alterations of official data on paper or electronic resumes, or unauthorized collaboration with another student or students. Violations include, but are not limited to:

A. **Cheating on examination**. Any attempt by a student to alter his or her performance on an examination in violation of that examination's stated or commonly understood ground rules.
B. **Plagiarism.** Representing the work of another as one's own. Plagiarism includes but is not limited to the following: copying the answers of another student on an examination, copying or restating the work or ideas of another person or persons in any oral or written work (printed or electronic) without citing the appropriate source, and collaborating with someone else in an academic endeavor without acknowledging his or her contribution. Plagiarism can consist of acts of commission-appropriating the words or ideas of another-or omission failing to acknowledge/document/credit the source or creator of words or ideas (see below for a detailed definition of plagiarism). It also includes colluding with someone else in an academic endeavor without acknowledging his or her contribution, using audio or video footage that comes from another source (including work done by another student) without permission and acknowledgement of that source.
C. **Misrepresentation or falsification of data** presented for surveys, experiments, reports, etc., which includes but is not limited to: citing authors that do not exist; citing interviews that never took place, or field work that was not completed.
D. **Theft of an examination**. Stealing or otherwise discovering and/or making known to others the contents of an examination that has not yet been administered.
E. **Unauthorized communication during examinations**. Any unauthorized communication may be considered prima facie evidence of cheating.
F. **Knowingly allowing another student to represent your work as his or her own**. This includes providing a copy of your paper or laboratory report to another student without the explicit permission of the instructor(s).
G. **Forgery, alteration, or knowing misuse of graded examinations, quizzes, grade lists, or official records of documents**, including but not limited to transcripts from any institution, letters of recommendation, degree certificates, examinations, quizzes, or other work after submission.
H. **Theft or destruction of examinations or papers** after submission.
I. **Submitting the same work in more than one course** without the consent of instructors.
J. **Altering or destroying another student's work or records**, altering records of any kind, removing materials from libraries or offices without consent, or in any way interfering with the work of others so

as to impede their academic performance.

K. **Violation of the rules governing teamwork**. Unless the instructor of a course otherwise specifically provides instructions to the contrary, the following rules apply to teamwork: 1. No team member shall intentionally restrict or inhibit another team member's access to team meetings, team work-in-progress, or other team activities without the express authorization of the instructor. 2. All team members shall be held responsible for the content of all teamwork submitted for evaluation as if each team member had individually submitted the entire work product of their team as their own work.
L. **Failure to sit in a specifically assigned seat during examinations.**
M. **Conduct in a professional field assignment that violates the policies and regulations of the host school or agency.**
N. **Conduct in violation of public law occurring outside the University that directly affects the academic and professional status of the student, after civil authorities have imposed sanctions.**
O. **Attempting improperly to influence the award of any credit, grade, or honor.**
P. **Intentionally making false statements to the Academic Conduct Committee or intentionally presenting false information to the Committee.**
Q. **Failure to comply with the sanctions imposed under the authority of this code.**

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, Jennifer Sullivan. Jen is here to ensure you have a positive online experience. You will receive emails and announcements from Jen throughout the semester. Jen 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, Jen 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 jensul@bu.edu or call (617) 358-1978.

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, Michelle Younger. Michelle administers the academic aspects of the program, including admissions and registration. You can ask her questions about the program, registration, course offerings, graduation, or any other program-related topic. She 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.

Professor Guanglan Zhang, Computer Science Department Chairman. You can reach Professor Zhang at guanglan@bu.edu or at 617-358-5688.

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 Zhang, 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 accommodations are in place. Accommodations cannot be implemented if the student does not send their letter.

Netiquette

BU Virtual has produced a netiquette guide to help you understand the potential impact of your communication style.

Before posting to any discussion forum, sending an email, or participating in any course or public area, please consider the following:

Ask Yourself…

- How would I say this in a face-to-face classroom or if writing for a newspaper, public blog, or wiki?
- How would I feel if I were the reader?
- How might my comment impact others?
- Am I being respectful?
- Is this the appropriate area or forum to post what I have to say?

Writing

When you are writing, please follow these rules:

- **Stay polite and positive in your communications.** You can and should disagree and participate in discussions with vigor; however, when able, be constructive with your comments.
- **Proofread your comments before you post them.** Remember that your comments are permanent.
- **Pay attention to your tone.** Without the benefit of facial expressions and body language, your intended tone or the meaning of the message can be misconstrued.
- **Be thoughtful and remember that classmates' experience levels may vary.** You may want to include background information that is not obvious to all readers.
- **Stay on message.** When adding to existing messages, try to maintain the theme of the comments previously posted. If you want to change the topic, simply start another thread rather than disrupt the current conversation.
- **When appropriate, cite sources.** When referencing the work or opinions of others, make sure to use correct citations.

Reading

When you are reading your peers' communication, consider the following:

- **Respect people's privacy.** Don't assume that information shared with you is public. Your peers may not want personal information shared. Please check with them before sharing their information.
- **Be forgiving of other students' and instructors' mistakes.** There are many reasons for typos and misinterpretations. Be gracious and forgive other's mistakes or point them out privately and politely.
- **If a comment upsets or offends you, reread it and/or take some time before responding.**

Important Note

Don't hesitate to let your instructor or your faculty and student support administrator know if you feel others are inappropriately commenting in any forum.

All Boston University students are required to follow academic and behavioral conduct codes. Failure to comply with these conduct codes may result in disciplinary action.

Registration Information and Important Dates

View the drop dates for your course.

Withdraw or drop your course.

- If you are dropping down to zero credits for a semester, please contact your college or academic department.
- **Nonparticipation in your online course does not constitute a withdrawal from the class.**
- If you are unable to drop yourself on MyBU Student Portal, please contact your college or academic department.
- Online courses will open to students in Blackboard on the first day of the term.
- Online courses close to students three weeks after the last day of the term. Please plan to download and save any assignments or material you'd like to keep by that date.

Technical Support

Help Desk

Boston University IT Help Desk can be reached via email (ithelp@bu.edu), phone (617-353-4357) or by filling out the support form on their website. For IT Help Desk hours of operation, visit the contact page. If you are contacting IT outside of business hours, you will receive a response the following day. Visit the BU Information Services & Technology (IS&T) news page for announcements and system-wide alerts.

Technology Requirements and Resources

To successfully view all content in your course, it is important that your computer setup meets the necessary

minimum technical requirements. Certain courses with specific functionality or educational tools may require additional technical requirements, these details can be found on the Course Resources or Materials page in the Syllabus.

System Requirements

- Access to reliable, high-speed internet: Check your internet connection speeds
- Learning Management System (Blackboard): System Requirements
- Synchronous live classroom sessions (Zoom): System requirements for Windows, macOS, and Linux
- Courses with proctored exams (Examity): System requirements for Windows, macOS
- Two-factor authentication service for BU applications: Duo Security

Downloads

- Recommended web browsers: Mozilla Firefox or Google Chrome
- Synchronous live classroom sessions (Zoom): Zoom download center
- Courses with proctored exams (Examity): Desktop or laptop computer with Google Chrome or Microsoft Edge
- Two-factor authentication service for BU applications (Duo Security): optional Duo Mobile download for iOS or Duo Mobile download for Android

Recommended Hardware

- Desktop or laptop computer recommended for best experience, some course functionality including proctored exams are not compatible with phones or tablets
- Headset with built-in microphone for high quality audio during live classroom sessions
- Webcam (required for proctored exams)
- Working computer speakers (required for proctored exams)

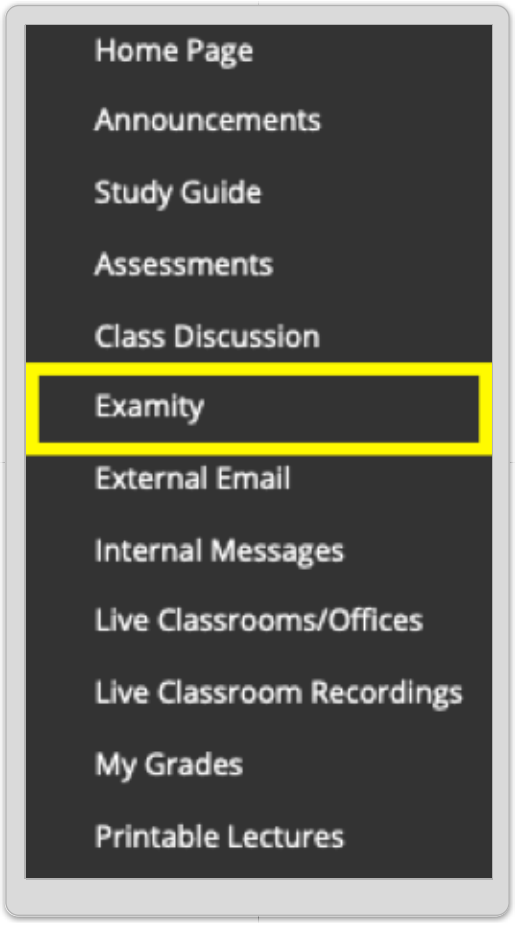
Clearing Your Browser Cache

It is recommended that users periodically clear their browser cache to ensure they are viewing the most current course content. Completing this step often resolves login issues and problems viewing course materials.

Proctored Exams

Courses with proctored exams will have an Examity link in the left-hand course navigation. This link will not

appear until scheduling opens. The BU Virtual Assessment Administrator will notify you when it is time to schedule your exam. Details on Examity's technical requirements and how to schedule your exam are in the Proctored Exam Information module on the course homepage. The Assessment Administrator can be reached at pexams@bu.edu. Examity support is available 24/7 via phone (855-392-6489), email (support@examity.com), or 'live chat' when logged in to the Examity dashboard.



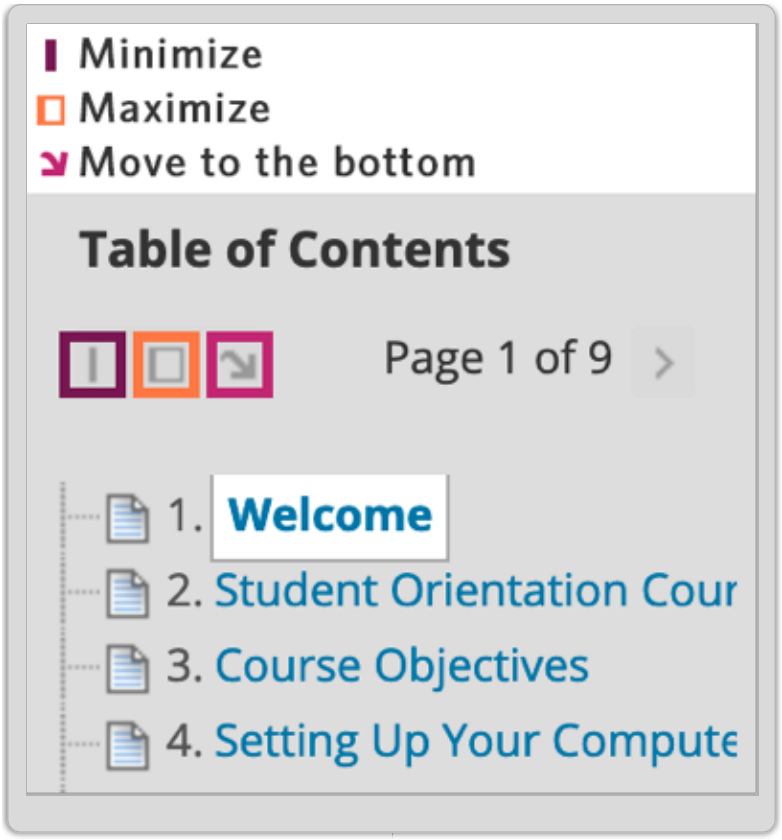
Navigating Courses

While navigating through your courses it's important to note that all hyperlinks will open in a new browser window.

The Blackboard navigation tools—shown in the images below—allow you to show and hide both the Course Menu and the Table of Contents which can free up space when moving through weekly lecture material.

The Table of Contents may contain folders that open and close (+ and – signs) and may conceal some pages. To avoid missing content pages, you are advised to use the next- and previous-page buttons (and icons) in the top-right corner of the learning content.

Navigation tools for the Table of Contents are shown in the image below:



Clicking the space between the Course Menu and the Table of Contents allows you to show or hide the Course Menu on the left: