



TELE6300 Communication and Network Security

FALL 2024

COURSE INFORMATION

Course Title: Communication and Network Security

Course Number: TELE6300

Term and Year: Fall 2024

Credit Hour: 4

CRN: 21730

Course Format: In-person

INSTRUCTOR INFORMATION

Name: Ritesh Mukherjee

E-mail Address: r.mukherjee@northeastern.edu

Office Hours: Online

INSTRUCTOR BIOGRAPHY

Ritesh Mukherjee is an accomplished leader focusing on global communications and technology. Ritesh helps product strategy and innovation at DriveNets, focusing on pioneering core network transformations and harnessing AI's potential in networking.

Ritesh Mukherjee brings a wealth of experience from his tenure at industry giants. As the Senior Vice President and General Manager at Inseego, he was responsible for product design, solutions engineering, technical marketing, and customer success. At Reliance Jio, he managed a global portfolio of market-leading enterprise solutions as Vice President. His role as Vice President of Product Management at 128 Technology (acquired by Juniper Networks) saw him leading SD-WAN and cloud development. Prior to this, he was a Product Management Leader at Cisco, where he led the software operating systems group. Ritesh's leadership has been instrumental in engineering some of the largest deployments of enterprise and operator networks globally.

Complementing his professional roles, Ritesh is also a dedicated educator. He shares his Computer Networks and Security expertise as an Adjunct Faculty Member at Northeastern University and the Benjamin Franklin Cummins Institute of Technology.

Ritesh's academic journey is equally impressive. He holds a Ph.D. in Computer Science from Concordia University, Montreal, a testament to his deep understanding and contributions to the field.

COURSE PREREQUISITES

N/A

COURSE DESCRIPTION

This course is designed to equip students with the skills necessary to apply and implement network and communication security in enterprise environments. By the end of the course, students will have a comprehensive understanding of network and communication security principles and practices.

Students will learn various concepts related to computer security and network protection. The course will cover systems security, access control, network infrastructure, assessments and audits, cryptography, and organizational security. This material will help protect enterprise networks' confidentiality, integrity, and availability. Students will also learn about common network attacks, cryptography basics, computer forensics, and operational/organizational security related to physical security, disaster recovery, and business continuity. The course will also discuss recent trends in network security attacks and cyber-attacks in general and analyze various attacks, including worms and trojans, SSL/TLS session renegotiations/compression, DNS security, spam, and crypto-based countermeasures.

The course has a laboratory component. In addition to the conceptual problems, each student must perform several laboratory assignments on their computer in a sandboxed virtual machine. Labs include network scanning, host/network intrusion detection, buffer overflow attacks, password cracking, SQL injection, and cross-site scripting.

The course culminates in a project where the students apply the acquired conceptual and practical knowledge of network security protocols and applications to designing network security for an enterprise scenario. The project will be done in teams of 3-4 students.

COURSE LEARNING OUTCOME

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

- Ensure the confidentiality, integrity, and availability of data
- Design computer security to meet business requirements
- Design security to meet technical requirements
- Provide risk mitigation and ensure business continuity
- Design an audit strategy
- Plan and design administrative access to the network
- Plan security for network service
- Plan, design, and manage a certification authority hierarchy
- Perform encryption of transmitted data
- Implement firewall rules and strategies
- Design, define, develop, and maintain a comprehensive security plan

REQUIRED TEXTBOOK

CompTIA Security+ Guide to Network Security Fundamentals, 8th Edition - Mark Ciampa
ISBN-13: 9798214000633

COURSE WEBSITE

<https://northeastern.instructure.com/courses/175975>

TENTATIVE SCHEDULE

WEEK	TOPIC	TYPE
1 (September 09)	<i>Introduction to Information Security</i>	<i>Lecture</i>
2 (September 16)	<i>Pervasive Attack Surfaces and Controls</i>	<i>Lecture</i>
3 (September 23)	<i>Fundamentals of Cryptography Advanced Cryptography</i>	<i>Lecture</i>
4 (September 30)	<i>Endpoint Vulnerabilities, Attacks, and Defenses</i>	<i>Lecture</i>
5 (October 07)	<i>Mobile and Embedded Device Security</i>	<i>Lecture</i>
- (October 14)	Indigenous Peoples Day	<i>No class</i>
6 (October 21)	<i>Midterm Identity and Access Management</i>	<i>Exam Lecture</i>
7 (October 28)	<i>Infrastructure Threats and Security Monitoring</i>	<i>Lecture</i>
8 (November 04)	<i>Infrastructure Security</i>	<i>Lecture</i>
- (November 11)	Veterans Day	<i>No class</i>
9 (November 18)	<i>Wireless Network Attacks and Defenses</i>	<i>Lecture</i>
10 (November 25)	<i>Cloud and Virtualization Security</i>	<i>Lecture</i>
11 (December 02)	<i>Incident Preparation and Investigation Oversight and Operations Information Security Management</i>	<i>Lecture</i>
12 (December 09)	<i>Final Project Submission</i>	<i>Exam Project</i>

INSTRUCTION METHODOLOGY

This course will combine traditional lectures with hands-on assignments. Classes will focus on concepts and ideas, while the assignments will provide substantial experience and skills. Students will also have a final project, allowing them to apply what they learned from the lectures to exciting topics.

GRADING POLICY

Coursework will be weighted as follows:

Work Type	Percentage
Assignment	12%
Lab	24%
Midterm Exam	20%
Project	20%
Final Exam	20%
Attendance	4%

EXAMINATION POLICY

There are two primary examinations: the mid-term and the final exam. The dates/rooms for these examinations will be announced beforehand. The assessments will consist of material that has been covered.

GRADING SYSTEM

Grade	Percentage	Definition
A A-	95 – 100 90 – 94.9	Student learning and accomplishment far exceed the published objectives for the course/test/assignment, and student work is consistently distinguished by its high level of competency and innovation.
B+ B B-	87 – 89.9 84 – 86.9 80 – 83.9	Student learning and accomplishment meet all published objectives for the course/test/assignment, and student work demonstrates the expected level of understanding and application of concepts introduced.
C+ C C-	77 – 79.9 74 – 76.9 70 – 73.9	Student learning and accomplishment based on the published course/test/assignment objectives were met with minimum passing achievement.
F	0 – 69.9%	Student learning and accomplishment based on the published course/test/assignment objectives were not sufficiently addressed or met.

<https://registrar.northeastern.edu/article/university-grading-system/>

ATTENDANCE POLICY

Students registered in MGEN courses (INFO, CSYE, and DAMG) are allowed a maximum of 2 absences per course, with three or more absences resulting in an automatic 'F' for that course. Students are expected to inform their instructors of any absences in advance of the class; if a student is sick long-term or experiences a medical issue that prevents class attendance, it is strongly encouraged that they speak with their Academic Advisor (coe-mgen-gradadvising@northeastern.edu) to learn more about the Medical Leave of Absence. Should students anticipate being unable to attend three or more classes, they should discuss their situation with their Academic Advisor to explore other types of leave per the University's academic and global entry expectations. International students should review the Office of Global Services webpage to understand their visa compliance requirements. Teaching Assistants (TAs) or Instructional Assistants (IAs) will be present at each class to collect student attendance.

LATE WORK POLICY

Students must submit assignments by the deadline in the time zone noted in the syllabus. If they anticipate work will be submitted late, they must communicate with the faculty prior to the deadline. Work submitted late without prior communication with faculty will not be graded.

END-OF-COURSE EVALUATION SURVEYS

Your feedback regarding your educational experience in this class is vital to the College of Professional Studies. Your comments will make a difference in our curriculum's future planning and presentation.

At the end of this course, please take the time to complete the evaluation survey at <https://neu.evaluationkit.com>. Your survey responses are **entirely anonymous and confidential**. For courses six weeks in length or shorter, surveys will be open one week before the end of the courses; for courses greater than six weeks in length, surveys will be open for two weeks. An email will notify you when surveys are available to your Husky Mail account.

MGEN STUDENT FEEDBACK

Students who would like to provide the MGEN unit with anonymous feedback on this particular course, Teaching Assistants, Instructional Assistants, professors, or to provide general feedback regarding their program, may do so using this survey:

https://neu.co1.qualtrics.com/jfe/form/SV_cTIAbH7ZRaaW0Ki.

UNIVERSITY HEALTH AND COUNSELING SERVICES

As a student enrolled in this course, you are fully responsible for assignments, work, and course materials outlined in this syllabus and the classroom. Over the semester, if you experience any health issues, please get in touch with UHCS.

For more information, visit <https://www.northeastern.edu/uahcs>.

STUDENT ACCOMMODATIONS

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the university's activities. To receive accommodations through the DRC, students must provide appropriate documentation demonstrating a substantially limiting disability.

For more information, visit <https://drc.sites.northeastern.edu>.

LIBRARY SERVICES

The Northeastern University Library is the hub of campus intellectual life. Its resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and education-specific resources, visit <https://library.northeastern.edu>.
Network Campus Library Services: [Northeastern University Library Global Campus Portals](#)

24/7 CANVAS TECHNICAL HELP

For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Student Resources: <https://canvas.northeastern.edu/student-resources/>

For assistance with my Northeastern e-mail and essential technical support:
Visit ITS at <https://its.northeastern.edu>.

Email: help@northeastern.edu

ITS Customer Service Desk: 617-373-4357

DIVERSITY AND INCLUSION

Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit <http://www.northeastern.edu/oidi/> for complete information on Diversity and Inclusion.

Title IX

Title IX of the Education Amendments of 1972 protects individuals from sex—or gender-based discrimination, including discrimination based on gender identity, in educational programs and activities that receive federal financial assistance.

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

Please visit <https://www.northeastern.edu/ouec> for a complete list of reporting options and resources on- and off-campus.

This course syllabus may be subject to change.