Northeastern
College of Engineering

TELE7374 / CSYE7374 Communication / Network Security

COURSE INFORMATION

Course Title: Communication / Network Security
Course Number: TELE7374 / CSYE7374
Term and Year: Spring 2024
Credit Hour: 4
Course Format: In-person
Meeting Time: Monday | 09:15 AM – 12:45 PM
Meeting Location: Boston Campus | TBA

INSTRUCTOR INFORMATION

Name: Ritesh Mukherjee
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INSTRUCTOR BIOGRAPHY

Ritesh Mukherjee is an accomplished leader focusing on global communications and technology. Ritesh leads product design, solutions engineering, and customer success as Senior Vice President and General Manager at Inseego. He is responsible for transforming digital networks with 5G, MEC, SDN/NFV, SDWAN, SASE, and Cloud solutions.

Before joining Inseego, Ritesh was Vice President at Reliance Jio, managing a global portfolio of market-leading innovative enterprise solutions. He was Vice President of Product Management at 128 Technology (acquired by Juniper Networks), leading SD-WAN and cloud development, and Product Management Leader at Cisco, leading the software operating systems group. Ritesh has engineered some of the largest deployments of enterprise networks for leading businesses globally. He is a sought-after speaker and thought leader.

Ritesh teaches Computer Networks and Security courses as an Adjunct Faculty Member at Northeastern University and Benjamin Franklin Cummins Institute of Technology.

Ritesh holds a Ph.D. in Computer Science from Concordia University, Montreal.

COURSE PREREQUISITES

N/A

COURSE DESCRIPTION

This course provides skills necessary to apply and implement network and communication security in enterprise environments.

Students will learn various concepts related to computer security and network protection. Topics will include 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 learn about common network attacks, cryptography basics, computer forensics, and operational/organizational security related to physical security, disaster recovery, and business continuity. We will discuss recent trends in network security attacks and cyber-attacks in general. We will 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, 7th Edition - Mark Ciampa
ISBN-13: 9780357709597

COURSE WEBSITE

TBA

TENTATIVE SCHEDULE

WEEK	*TOPIC*	*TYPE*
1 (January 08)	*Introduction to Security*	*Lecture*
2 (January 22)	*Threat Management and Cybersecurity Resources*	*Lecture*
3 (January 29)	*Threats and Attacks on Endpoints*	*Lecture*
4 (February 05)	*Endpoint and Application Development Security*	*Lecture*
5 (February 12)	*Mobile, Embedded, and Specialized Device Security* *Basic and Advanced Cryptography*	*Lecture*
6 (February 26)	*Networking Threats, Assessments, and Defenses*	*Lecture*
7 (March 04)	*Midterm | Network Security Appliances and Technologies*	*Exam | Lecture*
8 (March 11)	*Cloud and Virtualization Security*	*Lecture*
9 (March 18)	*Wireless Network Security*	*Lecture*
10 (March 25)	*Authentication*	*Lecture*
11 (April 01)	*Incident Preparation, Response, and Investigation*	*Lecture*
12 (April 08)	*Cybersecurity Resilience, Risk Management, and Data Privacy*	*Lecture*
13 (April 22)	*Final | Project Submission*	*Exam | Project*

INSTRUCTION METHODOLOGY

This course will combine traditional lectures with hands-on assignments that reinforce the lecture material. 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 the learnings 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 published objectives for the course/test/assignment, and student work is distinguished consistently 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

Attendance is a crucial element for success in class. It is required unless you cannot make it due to illness or other urgent or emergent reasons. Contact me via e-mail before class for allowed absence unless you cannot. Here is the section from the student handbook: Students will not be penalized for excused absences, with the understanding that students may need to make up for the academic commitment from which they were cleared. Reasons for an excused absence include religious, medical issues, jury duty, bereavement, and military service. See the course catalog and other applicable policies for attendance and excusal guidelines.

LATE WORK POLICY

Students must submit assignments by the deadline in the time zone noted in the syllabus. Students must communicate with the faculty before the deadline if they anticipate work will be submitted late. 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.

ACADEMIC INTEGRITY

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. Promoting independent and original scholarship ensures that students derive the most from their educational experience and pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

Students must become familiar with their rights and responsibilities as academic community members. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, using study aids, the appropriateness of assistance, and other issues. Students are responsible for learning documentation conventions and acknowledging sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integritypolicy/ to access the full academic integrity policy.

UNIVERSITY HEALTH AND COUNSELING

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/uhcs.

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 http://www.northeastern.edu/drc/getting-started-with-the-drc/.

LIBRARY SERVICES

The Northeastern University Library is the hub of campus intellectual life. 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.

24/7 CANVAS TECHNICAL HELP

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

Canvas Faculty Resources: https://canvas.northeastern.edu/faculty-resources/

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
E-mail: 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, 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.