

Course Syllabus

Spring 2023

CS 351 – Introduction to Cybersecurity

Section: 001 & 005

Instructor: Asad Raza

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Course website (on CANVAS):

<https://njit.instructure.com/courses/30771>

<https://njit.instructure.com/courses/30772>

Office hours: Thursday 2:30-3:30 pm (Newark GITC 4214)

Also, by appointment via email.

Prerequisites:

Prerequisites: CS 241 and CS 356.

Textbook:

"Computer Security: Principles and Practice", by W.Stallings and L.Brown, (Fourth Edition)

"Computer and Internet Security: A Hands-on Approach", by W.Du (Second Edition) (Optional)

Tools: These tools are optional but are important to increase hands-on ability in Cybersecurity.

- Kali
- Seed Labs

Description:

This course will give a broad overview of cybersecurity. There are three main goals of this course. Firstly, students will learn fundamental concepts of cybersecurity. Secondly, this course will help students gain knowledge of the applications to computer systems

and communication security. Finally, after this course students will be familiar with some of the "essential" cybersecurity tools that are used in industry.

A tentative list of topics includes:

- Course Introduction and Overview
- Fundamental Security Design Principles
- Cryptography Introduction
- Cryptography - Symmetric Encryption – Introduction to Block Ciphers
- Cryptography - AES, Stream Ciphers and Block Cipher Modes
- Public-Key Cryptography – RSA and Digital Signatures
- Public-Key Cryptography- Public Key Infrastructure and CA
- Hash Functions – Introduction to One-Way Hash Algorithms
- Hash Functions – MAC/HMAC, Hash Length Extension Attack
- Malicious Software – Virus, Worms, SE, Botnet, Phishing Labs
- Intrusion Detection Systems
- Network Architecture, Firewalls, Intrusion Prevention Systems
- Operating System Security
- Vulnerability Management
- Denial of Service Attacks (DoS)
- Database and Cloud Security
- Web Application Attacks (SQL Injection, XSS, CSRF)
- User Authentication

Grading:

Assignments: 30%

Quizzes: 10%

Midterm exam: 25%

Final exam: 35%

Extra credit will be given for active participation (+ pop quizzes) in discussions during the class. (up to 5%)

Honor Code:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

<http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf> Links to an external site..

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu*

Note in particular that cheating on exams, copying homework assignments and exam papers, and plagiarizing (in full or in part) someone else's work is forbidden.

Collaboration of any kind is PROHIBITED in the exams. As part of projects, students must turn in code or work that has fully been written by him/her and no-one else. Any submitted text or code (even few lines) obtained through the Internet or otherwise, or is product of someone else's work, risks severe punishment, as outlined by the University; all parties of such interaction receive automatically 0 and grade is lowered by one or two levels. Likewise for Exams, if applicable. The work you submit must be the result of your own mental effort and you must safeguard it from other parties; if you can't protect your home computer, use a Lab (AFS) machine.

Modifications to Syllabus:

The syllabus may be modified at the discretion of the instructor or in the event of extenuating circumstances. Students will be notified in class of any changes to the syllabus.