Special Topics in Network Security
Instructor: Danny Y. Huang
Fall 2021

Course Prerequisite:

- ECE-GY 6353 Internet Architecture & Protocols (formerly ECE-GY 5373);
- or ECE-UY 3613 Communication Networks;
- or equivalent (with the instructor's approval)

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Course Description:

The importance of securing network communications cannot be underestimated. Networks affecting our financial markets, military security, commercial transactions and personal life are all under threat and have been repeatedly breached. This course will cover the elements of network security at all layers of the protocol stack, and for both wireline and wireless networks. Students will gain practical experience with network security tools and techniques through hands-on lab assignments related to each topic. Some cryptography will be taught, so that students can get an insight into modern secure communications.

Evaluation: Weekly quizzes (20%), Labs (20%), Project(20%), Midterm (20%), Final (20%). Lowest quiz grade will be dropped.

Textbooks (optional):

1. Network Security Essentials: Applications and Standards, by William Stallings (Sixth Edition), Pearson.
2. Cryptography Engineering: Design, Principle and Practical applications, by Niels Ferguson, Bruce Schneier, and Tadayoshi Kohno, Wiley.

Course Outline (by week):

1. Introduction to network security
2. Introduction to Cryptography
3. Key Distribution
4. Network Protocol Security
5. Network Infrastructure Security
6. Wireless Network Security
7. Mid-Term Exam
8. Network Defense
9. Web and Mobile Application Security
10. Network Privacy and Anonymity
11. Cryptography II
12. Security of the Internet of Things

13. Blockchains
14. Final Exam

Teaching Assistants:
TBD

Office Hours and help:
TBD

Academic integrity policies: To avoid charges of plagiarism:

- In anything you submit, you must make sure it is obvious to the reader which words, images, ideas, or other intellectual content are yours and which originally came from someone else.
- If you use intellectual content from someone else (note that "someone else" may be a textbook, a published paper, Wikipedia, a blog post, YouTube, your friend, etc.), you must attribute it to its source (make it clear where the content came from) and be specific about what you are attributing (for example: whether the ideas alone are from somewhere else, or both the ideas and the words).

If anything about this rule is unclear, please ask an instructor for clarification.

Please familiarize yourself with the NYU Tandon policy on academic misconduct: http://engineering.nyu.edu/life/student-affairs/code-of-conduct

Other important university policies:

Disabilities: If you are a student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

Excused absences: For absences due to religious observance, the School of Engineering's policy requires students provide Deanna Rayment, the Coordinator of Student Advocacy, Compliance, and Student Affairs (Deanna.Rayment@nyu.edu) with written notification 14 days in advance of the days to be taken off, along with the Excused Absence Form.

Students missing class or exams due to other personal matters, such as death in the family or medical conditions and illnesses, should notify the Office of Student Affairs by email of your absence, the reason for the absence, how long you think you may be away

and supporting documentation. Medical documentation should state: Exact dates of absence, Estimated of the length of your absence, and Return Date.