

CSE 543: COMPUTER SECURITY

Fall 2020

Instructor: Syed Rafiul Hussain

Email: hussain1@psu.edu

Office Hours: Zoom: T-TH 1:30pm-2:30pm
(link on CANVAS) or by appointment

Time: T-TH 12:05pm–1:20pm

Location: Zoom (Link on CANVAS)

Teaching Mode: Remote Synchronous

TA: Maryam Zare

Email: muz50@psu.edu

Office Hours: M-W 3:00pm–4:00pm

Zoom (Link on CANVAS)

Course Webpage: <https://syed-rafiul-hussain.github.io/index.php/teaching/cse543-f20/>

Overview

This course provides a graduate-level introduction to computer and network security. Students successfully completing this class will have a broad understanding of cyber security and rudimentary skills in security research. Students will also be able to evaluate works in academic and commercial security. The course begins with a tutorial of the basic elements of software security, cryptography, cryptanalysis, and systems security, and continues by covering a number of seminal papers and monographs in a wide range of security areas.

Topics covered include essential ideas about confidentiality, integrity, availability, software security, software vulnerabilities, secure programming, network security, authentication, security protocol design and analysis, key management, software security, software vulnerabilities, operating systems security, access control, information flow, virtualization security, intrusion detection, web security, and other emerging topics. A detailed list of lecture by lecture contents, assignments, and due dates (subject to change as semester evolves) is available on the course [schedule](#).

Please note that the specifics of this Course Syllabus are subject to change. Students will be notified of any changes and students will be responsible for abiding by them. Even if you print this syllabus, please check the course website often. Students are expected to log in to Canvas daily, to check for course updates, announcements, emails, discussions, etc.

Prerequisite: CMPSC461 (Programming Language Concepts) or equivalent course or sufficient programming experience since some of the projects and assignments require programming knowledge. Please check with the instructor if you are not sure about the prerequisite.

Reading Materials

Most of the course readings will come from seminal papers in the field. Links to these papers will be provided on the course pages. In addition, the following books will be used for readings and as reference material.

Textbook: Computer Security and the Internet: Tools and Jewels, Paul C. van Oorschot

Grading

The course will be graded on exams, reviews, assignments, projects, and class participation in the following proportions:

50%	Projects
15%	Mid-term Exam
25%	Final Exam
10%	Class Participation and Reviews

Course Projects: There will be two individual projects and one team research project during the semester. These projects will teach methods for both attack and defense (see Ethics Statement below). Details of the projects will be published on the course webpage.

Reviews: Understanding research papers is a key task in computer science research. In this class, students will provide one-page reviews research papers assigned as readings. Roughly one review will be due per week. These reviews are due at the beginning of class. Please submit a paper copy of your review.

Class Participation: Course lectures will be driven by the contents of assigned papers and book chapters. Students are going to be required to participate in discussions of the class materials and paper content during each lecture. Hence, the students ability to exhibit comprehension of papers is essential to a passing grade.

Lateness Policy: Project milestones are assessed a 15% per-day late penalty, up to a maximum of 4 days. Unless the problem is apocalyptic, don't give me excuses. Students with legitimate reasons who contact the professor before the deadline may apply for an extension.

Communication Policy

Announcements will be made through CANVAS/Piazza and the online class discussion will occur via Piazza. Questions related to class materials, projects, assignments, and exams will occur in Piazza. The instructor or the TA will try their best to respond to questions in Piazza within 24 hours. Unless there is a strong reason, the questions should be made public to everyone so that other students can chime in and the discussion can benefit all students. For sensitive subjects (e.g., grading), email the TA and CC the instructor.

Academic Integrity Policy

Please be aware of the EECS Department's Academic Integrity Policy at <http://www.eecs.psu.edu/students/resources/EECS-CSE-Academic-Integrity.aspx>.

Students are required to follow the university guidelines on academic conduct at all times. Students failing to meet these standards will automatically receive a 'F' grade for the course. The instructor carefully monitors for instances of offenses such as plagiarism and illegal collaboration, so it is very important that students use their best possible judgement in meeting this policy. The instructor will not entertain any discussion on the discovery of an offense, and will assign the 'F' grade and refer the student to the appropriate University bodies for possible further action.

Note that students are explicitly forbidden to copy anything off the Internet (e.g., source code, text) for the purposes of completing an assignment or the final project. Also, students are forbidden from discussing or collaborating on any assignment except where explicitly allowed in writing by the instructor.

Webcam Policy

This course may require you to have a webcam for class sessions and assessments. Classes and assessments may be conducted using Zoom or other technology which may use your computer's webcam or other technologies to communicate, monitor, and/or record classes, class activities, and assessments. Assessments may also be conducted using proctoring software, which may listen to you, monitor your computer screen, view you and your surroundings, and record (including visual and audio recordings) all activity during the proctoring process. Please contact your instructor if you are unable to comply or have any questions or concerns.

Class Recording

Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is used for educational use/purposes and only may be made available to all students presently enrolled in the class. For purposes where the recordings will be used in future class session/lectures, any type of identifying information will be adequately removed. (See <https://virusinfo.psu.edu/faq/topic/classes-and-academics-for-faculty-and-instructors>).

Copyright Statement

All course materials students receive or to which students have online access are protected by copyright laws. For courses in which they have previously been or are currently enrolled, students may use course materials and make copies for their own use as needed, but unauthorized distribution and/or uploading of materials without the instructor's express permission is strictly prohibited. [Policy AD 40](#) (Recording of Classroom Activities and Note Taking Services) addresses this issue. Students who engage in the unauthorized distribution of copyrighted materials may be held in violation of the University's Code of Conduct, and/or liable under Federal and State laws.

Ethics Statement

This course considers topics involving personal and public privacy and security. As part of this investigation we will cover technologies whose abuse may infringe on the rights of others. As an instructor, I rely on the ethical use of these technologies. Unethical use may include circumvention of existing security or privacy measurements for any purpose, or the dissemination, promotion, or exploitation of vulnerabilities of these services. Exceptions to these guidelines may occur in the process of reporting vulnerabilities through public and authoritative channels. Any activity outside the letter or spirit of these guidelines will be reported to the proper authorities and may result in dismissal from the class.

When in doubt, please contact the course professor for advice. Do not undertake any action which could be perceived as technology misuse anywhere and/or under any circumstances unless you have received explicit permission from Professor Jaeger.

Disability Accommodation Statement

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. Student Disability Resources (SDR) website provides con-

tact information for every Penn State campus (<http://equity.psu.edu/sdr/disability-coordinator>). For further information, please visit Student Disability Resources website (<http://equity.psu.edu/sdr/>).

Counseling and Psychological Services Statement

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

- Counseling and Psychological Services at University Park (CAPS) (<http://studentaffairs.psu.edu/counseling>): 814-863-0395
- Penn State Crisis Line (24 hours/7 days/week): 877-229-6400
- Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

Educational Equity/Report Bias Statements

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias webpage (<http://equity.psu.edu/reportbias/>).