

# Research Topics in Computer Security

## Course Description:

The goal of this course is to give students a broad overview of research topics in the field of computer security. Students will read, discuss, and review both foundational and recent papers, and learn how to present conference style talks on papers.

The papers have been selected to expose students to a wide range of computer security topics, including but not limited to: binary exploitation, side-channels, memory security, web security, ML security, applied cryptography, and more.

Students will also complete a course research project on a security-related topic of their choosing.

## General Course Information:

Term: Fall 2024

Department: COMP

Course Number: 790

Section Number: 185

Time: MW, 12:20-1:35PM

Location: FB007

Website: <https://andrewkwong.org/comp790-185.html>

## Instructor Information:

Name: Andrew Kwong

Office: FB340

Email: [andrew@cs.unc.edu](mailto:andrew@cs.unc.edu)

Website: <https://andrewkwong.org>

Office Hours: by appointment

## Target Audience:

This class is intended for graduate students interested in exploring the many facets of computer security research and how it may intersect with

their own research interests. Interested undergrads are also welcome; they should ask the instructor for an override. A background in computer security is not required, though students may find it helpful.

**Prerequisites:**

There are no prerequisites for this course. Interested undergraduates may request an override.

**Goals and Key Learning Objectives:**

By the end of this course, students should:

- Be comfortable with reading cutting edge research papers in computer security, and be able to analyze the papers' strengths and weaknesses
- Be able to conduct novel research on a topic within computer security
- Be able to give a conference style presentation on their research project results

**Grading Criteria:****Class Participation (20%):**

Students are expected to contribute to class discussions following paper presentations. Students should be able to ask insightful questions and demonstrate that they have read and understand the assigned readings.

**Paper Presentations (20%)**

Students will give conference style talks on assigned papers. They will prepare slides and a 15 minute presentation on the papers.

**Paper Reviews (20%)**

Students will submit mini-reviews on assigned papers to Canvas.

**Course Project (40%)**

Students will conduct original research on a topic related to computer security over the course of the semester. Students will propose a project

part-way through the class, and will submit a final report (6-12 pages) by the end of the course. Students will also give a conference style talk on their results during the final week of class. Working in groups is allowed, but a more substantial product is expected when working as a group.

### **Class Schedule and Important Dates:**

Please see the class website for a detailed calendar of important dates and the reading schedule.

### **Accessibility Resources and Services:**

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability, or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities.

Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: <https://ars.unc.edu> or email [ars@unc.edu](mailto:ars@unc.edu).

### **Counseling and Psychological Services:**

CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

### **Title IX Resources:**

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University's Title IX Coordinator

([titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)), Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators ([gvsc@unc.edu](mailto:gvsc@unc.edu); confidential) to discuss your specific needs. Additional resources are available at [safe.unc.edu](http://safe.unc.edu).

### **Policy on Non-Discrimination:**

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's Policy Statement on Non-Discrimination offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, creed, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (see contact info at [safe.unc.edu](http://safe.unc.edu)) or the Equal Opportunity and Compliance Office, or online to the EOC at <https://eoc.unc.edu/report-an-incident/>.

### **Diversity Statement:**

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate suggestions.

### **Syllabus Changes:**

I reserve the right to make changes to the syllabus, including assignment due dates and test dates. These changes will be announced as early as possible.