Introduction to Computer Security

Class code: CSCI-UA.0201

Instructor Details

[Click here and type name]

[Click here and type e-mail address]

[Click here and type phone number (optional)]

[Click here and type mobile number for field trips]

[Click here and type your office location and time of office hour, if appropriate]

Class Details

[Click here and type class name]

Location to be confirmed.

Prerequisites

CSCI-UA.0201 (Computer Systems Organization) and experience with computer systems level programming languages (e.g. C, and C++ programming).

Recommended prerequisite courses include CSCI-UA.0202 (Operating Systems), and CSCI-UA.0480-009 (Computer Networks). Experience with web development will also be helpful.

Class Description

Technology increasingly permeates every aspect of our lives (including communication, finance, health, utilities, etc.), and the security of the computer systems that enable these services has become a critical issue. This course will covers basic principles of computer security and security engineering. It will provide an introduction to fundamental cybersecurity concepts, principles, and techniques. The course will focus on security from an attacker's perspective (threat modeling) and the defender's perspective (building and deploying secure systems). Specific topics will include operating system security, network security, web security, security economics and security psychology. Course projects will focus both on writing secure code and exploiting insecure code.

Desired Outcomes

- Students learn basic principles of computer security
- Students will acquire knowledge in important security topics such as operating system security, network security, web security, security economics and security psychology.
- Students will write secure code and exploit insecure code from an attacker's perspective (threat modeling) and the defender's perspective (building and deploying secure systems).
Programming Projects (30%), Weekly Problem Sets (20%), Midterm Exam (20%), and final exam (30%).

Failure to submit or fulfill any required course component results in failure of the class.

**Assessment Expectations**

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NYU Paris aims to have grading standards and results in all its courses similar to those that prevail at Washington Square.
Here is NYU’s Attendance Policy for students studying away at a Global Academic Center:

Study abroad at Global Academic Centers is an academically intensive and immersive experience, in which students from a wide range of backgrounds exchange ideas in discussion-based seminars. Learning in such an environment depends on the active participation of all students. And since classes typically meet once or twice a week, even a single absence can cause a student to miss a significant portion of a course. To ensure the integrity of this academic experience, class attendance at the centers is mandatory, and unexcused absences will affect students’ semester grades. Students are responsible for making up any work missed due to absence. Repeated absences in a course may result in failure.

Beginning Fall 2014, at all Global Academic Centers, unexcused absences will be penalized with a two percent deduction from the student’s final course grade.

Other guidelines specific to NYUParis include:

- **Attendance to class and all course-related events, even outside of regularly scheduled course times, is expected and mandatory. Some class outings/make-up classes take place on Fridays.**
- **Under no circumstances will non-University-related travel constitute an excused absence from class.** DO NOT book travel until you have received and carefully studied the syllabus of each of your classes.
- **If you are not sick enough to go to the doctor, you are well enough to go to class.** Doctor’s notes will be expected for all medical-related absences.
- **No tests, quizzes, or exams will be made up.** A missed test, quiz, or exam will result in a zero. Questions about this policy should be directed to the Academic Affairs team, not your professor.

No extension is allowed except in an extraordinary situation that must be approved by the professor.

New York University in Paris, as an academic community, is committed to free and open inquiry, to creating an intellectual and social environment that promotes this, and to upholding the highest standards of personal and academic integrity.

All NYUP students have the responsibility to uphold these stated objectives. As a member of this community, you accept the responsibility for upholding and maintaining these standards, which include refraining from all forms of plagiarism and cheating as detailed below.

Cases of plagiarism at NYUParis will be brought to the attention of NYUParis academic administration as well as the implicated student’s home school Dean.

**PLAGIARISM:** a form of fraud, presenting someone else’s work as though it were your own:

- A sequence of words from another writer who you have not quoted and referenced in footnotes
- A paraphrased passage from another writer’s work that you have not cited.
- Facts or ideas gathered and reported by someone else
- Another student’s work that you claim as your own
- A paper that is purchased or “researched” for money
- A paper that is downloaded free of charge from the Internet

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1 NYU’s “Policies and procedures for students studying away at a Global Academic Center”

2 NYU’s Expository Writing Department’s Statement on Plagiarism

3 NYU Statement on Plagiarism

4 NYU Statement on Plagiarism
CHEATING
- Copying from another student’s exam or quiz
- Giving or receiving unauthorized assistance (crib sheets, internet, etc.) during an exam or quiz
- Having someone take your exam
- Accessing an exam or quiz in an unauthorized fashion prior to its administration
- Collaborating with other students or unauthorized persons on a take home exam
- Using the same written material for two courses without the express permission of both instructors
- Fabricating or falsifying data

Required Text(s)

*Security Engineering* by Ross Anderson

ISBN-10: 0470068523

You can access this book via a [free online edition](#).

Supplemental Text(s) (not required to purchase as copies are in NYU-L Library)

[Click here and enter information, including ISBN]

Internet Research Guidelines

[Click here and enter guidelines on Internet Research, if appropriate]

Additional Required Equipment

[Click here and enter information (e.g. camera and film, sketch book)]

Session 1

Introduction & Threat Modeling

[Enter date]

Session 2

Part 1: Cryptography
Hashes & Authenticated Data Structures

[Enter date]

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<th>Symmetric Key Crypto</th>
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| Session 9 | Part 2: Network Security  
Routing and Eavesdropping |
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Session 12
Denial of service
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Session 13
Anonymity & Tor
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Session 14
Midterm exam
[Enter date]

Session 15
Spring break
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Session 16
Part 3: Physical Security
Hardware Security and Side Channels

Session 17
Locks, Keycards, and Relay Attacks

Session 18
Part 4: Software security
Isolation, ACL, and Sandboxes

Session 19
Systems software review

Session 20
Control flow hijacking

Session 21
Malware and worms

Session 22
Part 5: Web security
XSS & XSRF

Session 23
SQL injection and more
Session 24  Passwords & authentication
Session 25  Session management
Session 26  Spam and Abuse
Session 27  Part 6: Security & society
            Online crime
Session 28  Cybersecurity & security economics
Session 29  Ethics & Law

Classroom Etiquette

- No eating in class.
- No cell phones in class.
- No laptop computers in class unless permission is expressly given by your professors.
- Leaving class to go to the bathroom or yawning in class is considered rude in France.

Required Co-curricular Activities

[Click here and enter information about required activities, whether organised by NYU or not.]

Suggested Co-curricular Activities

[Click here and enter information about suggested activities, societies, lectures, etc.]

Your Instructor

[please brief text about yourself, possibly positions, publications, research specialism, conferences etc.]