



NYU

TANDON SCHOOL
OF ENGINEERING

Course Syllabus

Computer Science and Engineering
CS-GY 6813-Information Security & Privacy

Course Information

Course Pre-requisites

Prerequisite: Competency in Application Development in UNIX and Windows Environments, Graduate status.

Course Description

This course introduces Information Systems Security and covers cryptography, capability and access control mechanisms, authentication models, security models, operating systems security, malicious code, security-policy formation and enforcement, vulnerability analysis, evaluating secure systems. | *Online version available.

Course Objectives

This course will provide students with the opportunity to:

- Apply a security mindset while remaining ethical.
 - Implement security design principles.
 - Explain the core concepts of access control.
 - Implement reference monitors.
 - Apply security policies that are commonly used in modern operating systems.
 - Analyze the security of a basic secure system.
 - Explain virtualization and the impact on security and efficiency.
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Course Structure

This course is conducted entirely online, which means you do not have to be on campus to complete any portion of it. You will participate in the course using NYU Classes located at <https://newclasses.nyu.edu>.

Grading Breakdown

- Quizzes: 10%
- Exam 1 : 10%
- Exam 2 : 10%
- Final Exam: 20%
- Discussions: 10%
- Assignments: 40%

Weekly Structure

Week 1	Watch: Introduction to the Course Read: Lesson 1 Readings Interact: Lesson 1 Discussion Forum Complete: Assignment 1.1
Week 2	Watch: Security Design Principles Read: Lesson 2 Readings Interact: Lesson 2 Discussion Forum Complete: Assignment 1.2
Week 3	Watch: Threat Modeling Read: Lesson 3 Readings Interact: Lesson 3 Discussion Forum Complete: Assignment 1.3



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Week 4	Watch: Security Policies Read: Lesson 4 Readings Interact: Lesson 4 Discussion Forum Practice: Quiz Lessons 1 - 4 Complete: Assignment 2.1
Week 5	Watch: Access Control (1): Operating Systems, phones & JC Interview Read: Lesson 6 Readings Interact: Lesson 6 Discussion Forum Complete: Assignment 2.2
Week 6	Take: Exam 1
Week 7	Watch: JC Interview
Week 8	Watch: Access Control (2): IFC, O-Cap Read: Lesson 7 Readings Interact: Lesson 7 Discussion Forum Complete: Assignment 2.3
Week 9	Watch: Containerization: VMs, SFI, DoS Read: Lesson 8 Readings Interact: Lesson 8 Discussion Forum

	Practice: Quiz Lessons 6-8
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Week 10	Take: Exam 2
Week 11	Watch: Privacy and Key Management Read: Lesson 9 Readings Interact: Lesson 9 Discussion Forum Complete: Assignment 3.1
Week 12	Watch: Software validity and rights Read: Lesson 10 Readings Interact: Lesson 10 Discussion Forum Complete: Assignment 3.2
Week 13	Watch: Injection attacks and defenses Read: Lesson 11 Readings Interact: Lesson 11 Discussion Forum Complete: Assignment 3.3
Week 14	Watch: Cryptocurrency and IoT security Read: Lesson 12 Readings Interact: Lesson 12 Discussion Forum
Final Exam Week	Take: Final Exam



Learning Time Rubric

Learning Time Element	Asynchronous* / Synchronous**	Time on Task for Students (weekly)	Notes
Lecture (Active Module)	Asynchronous	2 - 3 hours	Video and interactive text format. Expect quizzes throughout the module.
Discussions	Asynchronous	0.5 hours	Students discuss instructor's questions for each lesson.
Reading	Asynchronous	1.5 hours	Students complete recommended readings (online journal articles and tutorials).
Assignments	Asynchronous	1.5 hours	Students will read assignments and watch guided solutions. Students will submit a short write-up (1-2 paragraph) of what they learned



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Course Communication

Announcements

Weekly Virtual Office Hours

The Teaching Assistant (TA) will be available for weekly virtual office hours by appointment. To schedule an appointment with your TA, or to ask any questions about the course content, please post to the discussion forms in NYU Classes.

Questions About the Course & Contacting the Instructor

To schedule an appointment with your TA, or to ask any questions about the course content, please post to the discussion forms in NYU Classes.

Readings

RECOMMENDED READINGS are online journal articles provided in each lecture. You can access NYU's central library here: <http://library.nyu.edu/>

You can access NYU Tandon's Bern Dibner Library here: <http://library.poly.edu/>

Assignments and Exams

Exams Administered and Proctored Online

Exams in this course are administered through NYU Classes. You are required to arrange an online proctor for your exams via ProctorU. More information



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on ProctorU and scheduling proctoring sessions can be found on [Tandon Online's website](#).

Exams Administered On Paper and Proctored Remotely

Exams in this course are administered via paper and pencil. If you are not able to attend an exam session on-campus, you are required to secure in-person proctoring arrangements near your location. Tandon Online's website

Course Schedule

Week 1: Topic

Weekly learning objectives:

- Watch: Introduction to the Course

Readings:

Lesson 1 Readings

Activities:

- Interact: Lesson 1 Discussion Forum

Assignments:

- Complete: Assignment 1.1

Week 2: Topic

Weekly learning objectives:

- Watch: Security Design Principles

Readings:

- Read: Lesson 2 Readings



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Activities:

- Interact: Lesson 2 Discussion Forum

Assignments:

- Complete: Assignment 1.2

Week 3: Topic

Weekly learning objectives:

- Watch: Threat Modeling

Readings:

- Read: Lesson 3 Readings

Activities:

- Interact: Lesson 3 Discussion Forum

Assignments:

- Complete: Assignment 1.3

Week 4: Topic

Weekly learning objectives:

- Watch: Security Policies

Readings:

- Read: Lesson 4 Readings

Activities:

- Interact: Lesson 4 Discussion Forum



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Assignments:

- Complete: Assignment 2.1
- Practice: Quiz Lessons 1 - 4

Week 5: Topic

Weekly learning objectives:

- Watch Access Control(1): Operating Systems, Phones, & JC Interview

Readings:

- Read: Lesson 6 Readings

Activities:

- Interact: Lesson 6 Discussion Forum

Assignments:

Complete: Assignment 2.2

Week 6: Topic

Weekly learning objectives:

- Take Exam 1

Week 7: Topic

Weekly learning objectives:

- Watch:JC Interview

Week 8: Topic

Weekly learning objectives:

- Watch: Access Control (2): IFC, O-Cap



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Readings:

- Read: Lesson 7 Readings

Activities:

- Interact: Lesson 6 Discussion Forum

Assignments:

- Complete: Assignment 2.3

Week 9: Topic

Weekly learning objectives:

- Watch: Containerization: VMs, SFI, DoS

Readings:

- Read: Lesson 8 Readings

Activities:

- Interact: Lesson 6 Discussion Forum
- Practice: Quiz Lessons 6-8

Week 10: Topic

Weekly learning objectives:

Take: Exam 2

Week 11: Topic

Weekly learning objectives:

- Watch: Privacy and Key Management



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Readings:

- Read: Lesson 9 Readings

Activities:

- Interact: Lesson 9 Discussion Forum

Assignments:

- Complete: Assignment 3.1

Week 12: Topic

Weekly learning objectives:

Watch: Software validity and rights

Readings:

Read: Lesson 10 Readings

Activities:

- Interact: Lesson 10 Discussion Forum

Assignments:

- Complete: Assignment 3.2

Week 13: Topic

Weekly learning objectives:

- Watch: Injection attacks and defenses



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Readings:

- Read: Lesson 11 Readings

Activities:

- Interact: Lesson 11 Discussion Forum

Assignments:

- Complete: Assignment 3.3

Week 14: Topic

Weekly learning objectives:

- Watch: Cryptocurrency and IoT security

Readings:

- Read: Lesson 12 Readings

Activities:

- Interact: Lesson 12 Discussion Forum

Final Exam Week

- Final Exam

University Policies

Moses Center Statement of Disability

Academic accommodations are available for students with disabilities. Please contact the Moses Center for Students with Disabilities (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting



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academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU Tandon School of Engineering Policies and Procedures on Academic Misconduct¹

- A. Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated. Furthermore, those who breach the School's rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School's Policy on Academic Misconduct.
- B. Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:
 - a. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person's work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.
 - b. Fabrication: including but not limited to, falsifying experimental data and/or citations.
 - c. Plagiarism: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.
 - d. Unauthorized collaboration: working together on work that was meant to be done individually.

¹ Excerpted from the [Tandon School of Engineering Student Code of Conduct](#)



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- e. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.
- f. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.