Introduction to Information Security (IST623)

Prerequisite/Corequisite

None

Audience

Graduate students

Description

This graduate course (IST623, Introduction to Information Security) is intended to teach fundamental elements in information security and introduce the key areas of security challenges, countermeasures, and applications. The course will focus on a comprehensive understanding of information security rather than an in-depth analysis of a particular area. Topics include security properties, vulnerabilities, cryptography, public key infrastructure (PKI), security policies, authentication, access control, security protocols, network security, cyber attacks, and security management. Students will also have research opportunities and hands-on experiences in information security. This is the only required course for the Certificate of Advanced Study (CAS) in Information Security Management (ISM).

Credits

3 credits

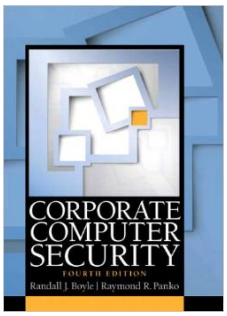
Learning Objectives

After taking this course, the students will be able to:

- Explain
  - The fundamental elements in information security.
  - In-depth security knowledge and skills in the research areas that they selected.
- Demonstrate
  - The hands-on ability to analyze security properties using various security services and tools.
  - The ability in collaboration with other colleagues to perform team projects in information security.
- Develop specialty
  - On a specific area of information security in their further study, extending the contents learned from this course.

Bibliography/Texts/Supplies—Required

- This introductory course in information security is intended to teach the comprehensive concepts and core elements in the area. Therefore, there is no single book that covers all the topics of the course. We will use the lecture materials developed by Dr. Park for this course and the textbook along with additional resources.
- Textbook (required)
  - *Corporate Computer Security* (4th ed.)
    - Authors: Randall Boyle and Raymond Panko
    - ISBN-13: 978-0133545197 or
    - ISBN-10: 0133545199

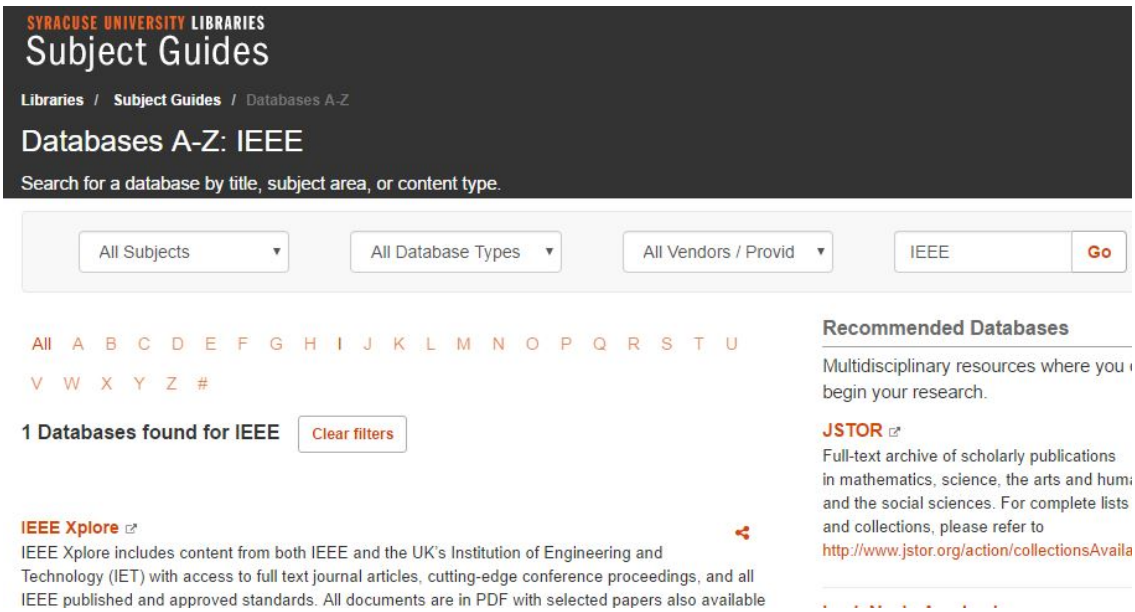


- In addition to the lecture slides and the required textbook, additional class materials will be available within the course LMS.
- Access to Customized Online Labs
  - Each student is required to purchase the lab access code in order to conduct the customized online labs throughout the semester.
  - For ordering, please refer to the instruction posted within the course LMS.
  - Once you log in the lab environment, you can use the online labs for this course anytime. Please make sure that **you use the customized lab manuals provided by the instructor**, instead of the ones integrated in the lab environment by the publisher.

Bibliography/Texts/Supplies—Additional

Recommended search engines for research articles:

- ACM Digital Library
- IEEE Xplore
- CiteSeer (http://citeseer.ist.psu.edu/)



** Note**

In order to access the digital libraries with the university's license, your access should start from Syracuse University Libraries (http://library.syr.edu/). You may need to find a specific database (e.g., ACM Digital Library or IEEE Xplore) first by selecting "Databases" under the "Find" menu (I entered "IEEE" and found "IEEE Xplore" in the example screen below.) If your current machine does not use an SU IP (say, you are using a home machine), you will be asked to log in with your SU NetID. Then, you can use the database for your search.

Requirements

Activities	Points	Weight
Assignments (5)	#1—Short Biography: 4 points #2—BLP Analysis: 5 points #3—SKC vs. PKC: 6 points #4—IPsec Modes: 7 points #5—P/F Firewalls vs. Proxy: 8 points	30%
Hands-on Labs (3)	#1: 5 points #2: 7 points #3: 8 points Bonus Lab: 3 points	23%
Case Study (Group)	Presentation: 20 points TME: 10 points	30%
Class Participation	20 points	20%
Total		**103%**

- **Working Groups:** Through the group activities in the course, all the students will have valuable experience working with group members for their case studies. The quality outcomes of the group activities can be counted for part of your professional career development. Typically, working groups will be formed in the second week of the course. Each team typically includes three to five students, with four being the ideal number.
- **Case Study (Group)**: Each group is required to choose a research topic and present its research outcomes to the class (about 30 minutes/group including Q&A) in Week#9 Live Session.
    - The topic can be in all aspects of security/privacy-related **specific cases**. For instance, topics of interest may include, but are not limited to, Target/Sony/JPMC/HomeDepot/iCloud/eBay/Facebook/Uber/Anthem/Yahoo/Equifax security breaches, Wannacry, Bitcoin, Stuxnet, Heartbleed, and other security/privacy related cases.
    - At the end of the course, each group is required to present its **final research outcomes** to the class and facilitate the Q&A session about the topic (about 30 minutes/group including Q&A).
    - Each presentation should cover the key points of the chosen topic, **lessons learned**, and **at least five references** (e.g., published news,

journal articles, conference proceedings, online resources, etc.) relevant to the topic, providing the URL, PDF, or other reference information.
    - Each group is required to post its presentation materials (e.g., slides, URL links, video/audio clips, etc.) to the course LMS **24 hours prior to its presentation**.
- **TME (individual)**: Group work needs a team effort by the members. Each member is required to contribute individually to a whole. To encourage each member's active participation in the group activities and produce a fair grading result, **each student** is required to submit his/her TME (Team Member Evaluation) at the end of the semester, considering self/peer contribution to the group work throughout the semester. TME is an individual evaluation. The instructor will take your TME very seriously for grading each student's group work. You must not share your TME with others. The TME form and the rubric will be available within the course LMS. I would like to urge you to start working with your group members for the group activities as soon as possible so that each member can spend sufficient time on his/her contribution to the team.
- **Hands-on Labs (individual)**: Each student will conduct hands-on labs in the online lab environment based on the class contents. Each student is required to submit the **lab report** after each lab. The customized lab manuals for this course will be provided by the instructor.

Grading Scale

Points Earned	Grade
90–100	A
85–89	A–
80–84	B+
75–79	B
70–74	B–
65–69	C+
60–64	C
55–59	C–
Below 55	F

Course Policies

- **Assignment Submission:** Please submit assignments as directed. All the assignments should be submitted in PDF via the course LMS. Do NOT e-mail assignments to the instructor or graduate assistants. E-mail attachments and hard copies will not be accepted. Assignments should be prepared in a professional manner according to the submission guidelines and with correct spelling and grammar.
- **Late Submission:** Considering the real-world constraints and professional responsibilities at work, students are required to submit all the assignments before or on the due date. The deadlines are firm. Late submissions will not be accepted.
- **Make-up Condition:** Make-up assignments will only be allowed if the student can provide a formal documentation through the corresponding office. If you are

having problems in keeping up with the class, you should contact the instructor immediately so that appropriate arrangements can be made as soon as possible.

- **Class Participation:** Real-world professionals are expected to attend and participate in all meetings that are concerned with the work. Therefore, weekly Live Session attendance **with your full video connection** is required. Live session participation with Audio-only or video-paused (no streaming) may negatively affect your point. If you arrive late or leave early, you will be marked absent. There are no excused absences unless documented by the university.

Tentative Class Schedule

Week No.	Topics	Class Activities	Readings	Assignments Due*
#1	Introduction (Security Programs, Course Overview, Security Properties, Security Trends, Threat Environment, Basic Terminologies)	Ice Breaker Assignment #1 (Short Biography)	Lecture Materials Textbook: Chap. 1.1–1.3	
#2	Security Policies (Security Policy Levels, Principles, Examples, Security vs. Privacy)	Form Research Groups	Lecture Materials Textbook: Chap. 2.5-2.7	Assignment #1 (Short Bio)
#3	Security Models (Access Control Models, BLP Rules, RBAC Concepts)	Assignment #2 (BLP Analysis)	Lecture Materials in Blackboard Textbook: Chap. 5.1, 5.7	
#4	Secret Key Cryptography (Operational Scheme, Basic Algorithms, Attack Analysis)	Lab #1	Lecture Materials Textbook: Chap. 3.1–3.2	Assignment #2
#5	Public Key Cryptography (Operational Schemes, Number Theory, Basic Algorithms, Digital	Assignment #3 (SKC vs. PKC)	Lecture Materials Textbook: Chap. 3.6–3.7	Lab #1 Report

	Hashes, Digital Certificates)			
#6	Authentication (Passwords, One-Time Passwords, Biometrics, Cryptographic Techniques, Kerberos)	Lab #2	Lecture Materials Textbook: Chap. 5.3–5.6	Assignment #3
#7	Internet Security Protocols (SSL/TLS, IP Tunneling, IPsec)	Assignment #4 (IPsec Modes) Course Booster Week	Lecture Materials Textbook: Chap. 3.10–3.11	Lab #2 Report
#8	Security in Wireless Networks (Wireless Network Attacks, Wireless Security Protocols, Comparison)	Lab #3 Case Study Q&A (Part I)	Lecture Materials in Blackboard Textbook: Chap. 4.6	Assignment #4 Each Group's Presentation Materials
#9	Case Study Dissemination	Case Study Q&A (Part II)	Group Presentations	Each Group's Presentation Materials Lab #3 Report
#10	Firewalls (Packet Filtering Firewalls, Proxy)	Assignment #5 (P/F Firewalls vs. Proxy) Course Wrap-up	Lecture Materials Textbook: Chap. 6.1–6.3, 6.5	
#11	No Live Session			Assignment #5 TME

Academic Integrity Policy

Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity

expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

Disability-Related Accommodations

If you believe that you need academic adjustments (accommodations) for a disability, please contact the Office of Disability Services (ODS), visit the ODS website– http://disabilityservices.syr.edu, located in Room 309 of 804 University Avenue, or call (315) 443-4498 or TDD: (315) 443-1371 for an appointment to discuss your needs and the process for requesting academic adjustments. ODS is responsible for coordinating disability-related academic adjustments and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since academic adjustments may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Syracuse University Policies

Students should review the University's policies regarding: Diversity and Disability https://www.syracuse.edu/life/accessibilitydiversity/; the Religious Observances Notification and Policy http://supolicies.syr.edu/studs/religious_observance.htm; and Orange SUccess http://orangesuccess.syr.edu/getting-started-2/

Student Academic Work Policy

Student work prepared for University courses in any media may be used for educational purposes, if the course syllabus makes clear that such use may occur. You grant permission to have your work used in this manner by registering for, and by continuing to be enrolled in, courses where such use of student work is announced in the course syllabus. I intend to use academic work that you complete this semester for educational purposes in this course during this semester. Your registration and continued enrollment constitute your permission. I intend to use academic work that you complete this semester in subsequent semesters for educational purposes. Before using your work for that purpose, I will either get your written permission or render the work anonymous by removing all your personal identification.

Course Evaluations

There will be an end of course evaluation for you to complete this term. This evaluation will be conducted online and is entirely anonymous. You will receive a notification from the Syracuse University Office of Institutional Research & Assessment (OIRA) department in your email account with the evaluation website link and your passcode. Please take the time and fill out this evaluation as your feedback and support of this assessment effort is very much appreciated. The school carefully reviews ratings and

comments that you submit, and these factor into decisions about course, program and instructor development.

University Enrollment Policy

Only officially registered students are allowed in this course. University policy prohibits students from attending, being evaluated, auditing, or participating in regular semester courses without being officially enrolled.

Schedule Change

The course schedule is a plan, which may be changed.