EECE 657 Network Security

Syllabus Spring 2015

Course Description

This is a graduate level research oriented course. The primary goal of the class is to expose students to cutting edge research and prepare them for conducting research independently. By reading and analyzing research papers recently published in prestigious international conferences and academic journals, the students are expected to construct a big picture of the focuses and trends in the network security area, master skills of learning through literatures, and develop the corresponding research capability.

Prerequisites:

EECE 553 Computer Network Architectures or EECE 359 Computer Networks; EECE 405 Cryptography and Information Security; or approved by instructor.

Instructor:

Dr. Linke Guo
Office: ES-2318, Phone: (607) 777 - 6593, Email: lguo@binghamton.edu
Office Hour: 3:00 ~ 4:00pm, Tuesday & Thursday, or by appointment.

Course Materials:

No required textbook. Readings will be papers from prestige conferences and journals.

Grading:

- ✓ Paper Reading/Presentation Assignments 40%
  - Paper Discussion and Presentations (10% x 2)
  - Paper Reading Reports (4 ~ 5 pages) (10% x 2)
- ✓ Research Project 50%
  - Mid-Term Project Demo (10%)
  - Project Presentation (15%)
  - Final Project Report (10 ~ 12 pages) (25%)
- ✓ Participation 10%

Letter-number grade mapping: [95-100] is A; [90-95) is A-; [87-90) is B+, [83-87) is B, [80-83) is B-, [77-80) is C+, [73-77) is C, [70-73) is C-, [60-70) is D, [0-60) is F.

Topics (tentative):

1. Overview of Network Security Problems
2. Overview of Social Networks, eHealth/mHealth, and Location-based Services
3. Introduction to Cryptography

4. Security and Privacy in Cloud Computing
5. Security and Privacy in Social Networks
6. Security and Privacy in Location-based Services
7. Security and Privacy in eHealth/mHealth System
8. Trust and Reputation System
9. Worms and Virus, DDoS Attacks, Intrusion Detection, Security and Privacy in Smart Grid

Policies:

"ZERO" Tolerance on Academic Dishonesty

All students must adhere to the Student Academic Honesty Code of the University and the Watson School. The Department of Electrical and Computer Engineering has adopted a standard policy to enforce these codes for violations involving course work. Category I violations result in a grade of 0 for the graded work plus a one letter course grade reduction. A Report of Category I Academic Dishonesty form is filed with the Provost's Office; if a prior report is already on file, the offense is automatically elevated to Category II. Category II violations result in a failing grade for the course plus any additional penalties determined by the Watson Academic Integrity Committee.

University Academic Honesty Code:
http://bulletin.binghamton.edu/program.asp?program_id=826

Watson School Academic Honesty Code:
http://www2.binghamton.edu/watson/advising/pdfs/honesty-policy.pdf

ECE Department Academic Honesty Code Enforcement Policy
http://www2.binghamton.edu/ece/grad/academic-honesty.html

Tentative Class Schedule EECE 657 SP 2015

Lec No.	Date	Lecture Content	Class Schedule	Note
1	1/27	Course Introduction	Lecture	
2	1/29	Network Security Overview	Lecture	
3	2/3	Social Networks Overview	Lecture	Group Member Notification Due
4	2/5		Lecture	Presentation 1 Title Due
5	2/10	Introduction to Crypto	Presentation 1 (Group 1)	
6	2/12		Presentation 1 (Group 2)	
7	2/17		Presentation 1 (Group 3)	
8	2/19	S&P in Cloud Computing	Presentation 1 (Group 4)	*Class may be cancelled due to travel
9	2/24		Presentation 1 (Group 5)	Project Topic Due
10	2/26		Presentation 1 (Group 6)	
11	3/3	S&P in Social Networks	Presentation 1 (Group 7)	Reading Report 1 Due
12	3/5		Presentation 1 (Group 8)	Presentation 2 Title Due
13	3/10		Presentation 1 (Group 9)	*Help Session for Mid-term Demo
14	3/12		Demo I	Mid-Term Project Check
15	3/17		Demo II	Mid-Term Project Check
16	3/19	S&P in Location-based Services	Presentation 2 (Group 1)	
17	3/24		Presentation 2 (Group 2)	
18	3/26	S&P in eHealth/mHealth	Presentation 2 (Group 3)	
19	3/31		Presentation 2 (Group 4)	
20	4/2	Trust and Reputation System	Presentation 2 (Group 5)	
21	4/7		No class (Spring Break)	
22	4/9			
23	4/14	Worms and Virus	Presentation 2 (Group 6)	Reading Report 2 Due
24	4/16	Ddos Attacks	Presentation 2 (Group 7)	
25	4/21	Intrusion Detection	Presentation 2 (Group 8)	Session for Project Demo (if necessary)
26	4/23	S&P in Smart Grid	Presentation 2 (Group 9)	
27	4/28	TBD	TBD	
28	4/30	TBD	TBD	*Students' Evaluation Score Due
29	5/5	TBD	TBD	
30	5/7	TBD	TBD	
31	5/12		Final Exam	Project Final Report Due

* For all assignments with due time, 10% daily penalty will be applied to late submission.
* All reports must follow IEEE conference paper format.

* The length of all paper presentations (project presentation if necessary) is 30 ~ 40 minutes with no less than 20 pages, including Q & A session. The presentation should be based on 1-2 research papers. Directly using authors' slides is not allowed.
* The topics of two presentations should NOT be identical.
* Presentations will be graded based on both instructor grading and peer grading.

* The paper reading report should contain at least three related technical papers, and the topics of two reports are required to be different. No survey based on survey is allowed.
* No requirement on the content consistency of project and paper reading report.

All Technical Papers must be selected from the following conferences and journals unless approved by the instructor.
1. *Security and Privacy*: ACM CCS, NDSS, ESORICS, Usenix Security, Crypto, TCC, EuroCypto, ASIACCS, SecureComm, PETS, Wisec, IEEE Security and Privacy, TISSEC - ACM

Transactions on Information and System Security, IEEE Transactions on Dependable and Secure Computing, IEEE Transactions on Information and Forensic Security
2. *Networking and Communications:* IEEE INFOCOM, IEEE ICDCS, IEEE ICNP, ACM Mobihoc, ACM MobiCom, ACM SIGCOMM, IEEE Transactions on Mobile Computing, IEEE Transactions on Networking, IEEE Transactions on Parallel and Distributed Computing, IEEE Transactions on Wireless Communication, Journal on Selected Topic in Communications
3. *Database:* ACM SIGMOD, VLDB, IEEE Transactions on Knowledge and Data Engineering