CSC 774 Network Security

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About Instructor

• Dr. Peng Ning, assistant professor of computer science
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  – ning@csc.ncsu.edu
  – (919)513-4457
  – Office: 453 EGRC, centennial campus
    • May move during the semester. Check the website.
  – Office hours: Mondays and Wednesdays, 3:00 pm
    – 4:00 pm
About TA

- Yan Zhai
  - yzhai@unity.ncsu.edu
- Office hours:
  - TBD

Course Objectives

- Understanding of fundamental issues, concepts, principles, and mechanisms in network security.
  - Network access control
  - IP security, transport security, application security.
  - Key management
  - Network intrusion detection
- Prepare students for graduate research in network security
  - Advanced topics: Intrusion detection, secure group communication, wireless network security.
Prerequisites

- CSC 570
- CSC 574
  - Strictly enforced.
  - Exam for those who haven’t taken CSC 574.
    - 50 minutes
    - 5 questions
    - You have to answer 3 out of 5 questions to stay in this class.

Textbook and Handouts

- Required texts
  - Research papers listed on the course website.
Course Mechanics

- WWW page:
  http://courses.ncsu.edu:8020/csc774/lec/001/
  - For course materials, e.g., lecture slides, homework files, papers, tools, etc.
  - Will be updated frequently. So check frequently, too.

- Message board at
  http://courses.ncsu.edu:8020/csc774/
  - For discussions, Q&As.

Grading

- Assignments: 10%;
- lab: 10%,
- midterm #1: 15%;
- midterm #2: 15%;
- final: 20%;
- Research/survey paper: 20%;
- in-class presentation: 10%  
  - 15 -- 20 minutes  
  - On a technical paper assigned by the instructor.
Grading (Cont’d)

• The final grades are computed according to the following rules:
  – A+: >= 95%; A: >= 90% and < 95%; A-: >= 85% and < 90%;
  – B+: >= 80% and < 85%; B: >= 75% and < 80%; B-: >= 70% and < 75%;
  – C+: >= 66% and < 70%; C: >= 63% and < 66%; C-: >= 60% and < 63%;
  – D+: >= 56% and < 60%; D: >= 53% and < 56%; D-: >= 50% and < 53%;
  – F: < 50%
• Audit students:
  – no in-class presentation;
  – grade will be adjusted by grade = grade/0.9;
  – need grade >=63% to pass.

Course Outline

• Prepare to spend at least 10 hours after class.
• Topics
  – Review of cryptographic techniques (self study)
  – Network access control (self study)
  – Internet layer security
  – Internet key management protocols
  – Transport layer security
  – Application layer security
  – Electronic payment systems (optional)
  – Network intrusion detection
• Self-study topics are included in homework assignments and exams.
Course Outline (Cont’d)

- Advanced Topics:
  - Intrusion Alert Correlation
  - Group Key Management
  - Routing Security in Wireless Ad-hoc Networks

- Every student is responsible for presenting on technical paper in class, and managing a discussion forum in the message board.
  - Will be graded. Instructions and grading policy will be posted on the course website.
  - *Content will be included in the final exam.*
  - Students are encouraged to write research papers related to these topics, but not required.

Research/Survey Paper

- Small team -- one to three persons.
- Proposal, work, and final write-up.
- Both proposal and the final submission will be graded.
- Grading policy will be posted.
- The instructor will be available to discuss your topic during the office hours.
Lab

- Will be coordinated with the networking lab.
- Time: TBD.
  - Will not take the lecture time.
- Team
  - Two to three students each team.
- Topic:
  - Operation of an open source intrusion detection system Snort.

Check the website for details!