



**NC STATE UNIVERSITY** Computer Science

# CSC 774 Network Security

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## About Instructor

- Dr. Peng Ning, assistant professor of computer science
  - <http://www.csc.ncsu.edu/faculty/ning>
  - [ning@csc.ncsu.edu](mailto: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

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## 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
  - Rolf Oppliger, *Internet & Intranet Security, 2/e.* Artech House, 2002. ISBN: 1580531660. (List price at amazon.com: \$79.00)
  - 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+:  $\geq 95\%$ ; A:  $\geq 90\%$  and  $< 95\%$ ; A-:  $\geq 85\%$  and  $< 90\%$ ;
  - B+:  $\geq 80\%$  and  $< 85\%$ ; B:  $\geq 75\%$  and  $< 80\%$ ; B-:  $\geq 70\%$  and  $< 75\%$ ;
  - C+:  $\geq 66\%$  and  $< 70\%$ ; C:  $\geq 63\%$  and  $< 66\%$ ; C-:  $\geq 60\%$  and  $< 63\%$ ;
  - D+:  $\geq 56\%$  and  $< 60\%$ ; D:  $\geq 53\%$  and  $< 56\%$ ; D-:  $\geq 50\%$  and  $< 53\%$ ;
  - F:  $< 50\%$
- Audit students:
  - no in-class presentation;
  - grade will be adjusted by  $\text{grade} = \text{grade}/0.9$ ;
  - need grade  $\geq 63\%$  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!