Textbooks


1. NB(Networking Background): *Computer Networks: A Systems Approach (4th Edition)*, by Larry L. Peterson and Bruce S. Davie - This book is available in online format via the IU library at [http://iucat.iu.edu/catalog/15520376](http://iucat.iu.edu/catalog/15520376) (Links to an external site.). It is recommended for those who may have limited knowledge of computer network topics, or those who may need to refresh their background.

Prerequisites

1. *(Required)* Some programming background is necessary. A specific language is not required, but it is assumed you can pick up new languages where needed for this course. One of the labs will be related to buffer overflows in C.
2. This course also assumes you are savvy with the Linux command line.

Topics

Below is a list of topics I intend to cover (all if time permits). I will provide a more concrete timeline in the schedule below. Each topic may contain multiple modules.

1. **NB** Network Overview
2. **RB** Chapter 2: Crypto crash course, PKI
3. **RB** Chapter 3: Authentication
4. **RB** Chapter 6: Malicious Software
5. **RB** Chapter 7: DoS Attacks
6. **RB** Chapter 8/9: Firewalls and Intrusion Detection
7. **RB** Chapter 10/11: Software Security
Grade Distribution

- Discussion - 10%
- Quizzes - 25%
- Labs - 40%
- Final Paper - 25%

Policies

Please see the following page for a discussion of course related policies: Policies

Research Papers

Please see the following page for a description of the final research paper: Research Papers

Class Schedule

The class schedule will be filled out progressively throughout the semester, with typically a 1–2 week outlook.

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<th>Module</th>
<th>Topic</th>
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<td>Module 1</td>
<td>Introduction and Administrivia</td>
<td>Course policies, Plagiarism (Links to an external site.)</td>
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<td>Module 2</td>
<td>Network Overview: Protocol Stack, Encapsulation</td>
<td>Peterson Ch 1.2.1, 1.2.3, 1.3,</td>
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Network Overview: Applications 1.1, 1.2.1, 9.1.3

**Module 3**  
Network Overview: Transport Layer:  
Demultiplexing, UDP, TCP  
Ch5 (pgs 380-391)

Network Overview: Network Layer:  
Internetworking, Addressing, Routing, Forwarding, Classless Inter-domain Routing, Subnetting  
Peterson CH 4.1 (pgs 232-239), 4.1.3, 4.1.4, 4.2 (pgs 266-267), 4.3.1, 4.3.2

**Module 4**  
Network Overview: Link Layer : Link Layer Services, Switched Local Networks  
Kurose and Ross 5.1 (pgs 433-438), 5.4 (pgs 461-469) handout

**Module 5**  
What is Security?  
SB Ch. 1.1–1.3

**Module 6**  
Cryptography in Practice  
SB Ch. 2.1–2.2

**Symmetric Cryptography Concepts I**

**Symmetric Cryptography Concepts II** SB Ch. 20.5

**Module 7**  
Asymmetric Cryptography: Encryption  
SB Ch. 2.3–2.5

**Asymmetric Cryptography: Signatures and Hash Functions** SB Ch. 2.3–2.5
Module 8

PKI and TLS

PKI/HTTPS: Continued

(same as last week)

Lab 5: PGP

Module 9

Authentication

Password-based authentication

Token-Based and Biometric Authentication

Module 10

Malicious Software

SB Ch. 6, Lenovo/Superfish
(Links to an external site.)
Malicious Software

Module 11

Intrusion Detection I

Intrusion Detection II

Module 12

Firewalls