CS 410/510 Network Security

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Course homepage: http://www.cs.pdx.edu/~cvwright/courses/netsec/

TA: David Pouliot
Email: dpouliot@cs.pdx.edu
Office Hours: Monday 10:15–11:15, Wednesday 2:00–3:00

Course Description
This is an advanced study of network security. Topics include historical and recent network-based attacks including denial of service attacks, a study of network security monitoring procedures including anomaly and signature-based detection, firewalls, and an in-depth study of defensive techniques at various layers of the ISO stack, including modern cryptographic protocols like IPSEC, SSL, and other application-layer security protocols.

Prerequisites    CS 494 Internetworking Protocols


Other Resources (free online)
• W3Schools Online Web Tutorials. http://www.w3schools.com/

Course Outline
1. Principles of Information Security  (0.5 weeks)
2. Vulnerabilities in Classical TCP/IP Network Protocols  (1 week)
3. Network Defense: Firewalls and Intrusion Detection  (1.5 weeks)
4. Basics of Applied Cryptography  (2 weeks)
5. Protocols for Authentication and Security  (2 weeks)
6. Security of Core Internet Infrastructure (DNS and BGP)  (1 week)
7. HTTP and Web Security  (1 week)
8. Privacy and Anonymity  (1 week)
Programming Exercises

This course will involve a significant programming component wherein students will work in groups to solve problems on a virtual network infrastructure. Class time will be made available each week to work on the exercises. Students will be responsible for writing up solutions and results from the exercises in a lab report outside of class. Additionally, exams may include a “take-home” portion with problems to be solved individually by each student using the lab infrastructure.

Grading

Final grades will be determined according to the following formula:

<table>
<thead>
<tr>
<th></th>
<th>CS 410</th>
<th>CS 510</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Programming Exercises</td>
<td>50%</td>
<td>40%</td>
</tr>
<tr>
<td>Presentation</td>
<td>n/a</td>
<td>10%</td>
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<tr>
<td>Midterm Exam</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
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Letter grades will be calculated according to the standard American system on a roughly 10-point scale. (A- ≈ 90%, B- ≈ 80%, C- ≈ 70%, etc.)

Late Work

Unless there are special circumstances, all lab assignments should be turned in no later than the assigned deadline. Some late work will be accepted, subject to the following penalties:

<table>
<thead>
<tr>
<th>Time past deadline</th>
<th>Grade Penalty</th>
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<tbody>
<tr>
<td>Less than 2 hours</td>
<td>-5%</td>
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<tr>
<td>Less than 48 hours</td>
<td>-50%</td>
</tr>
<tr>
<td>More than 48 hours</td>
<td>-75%</td>
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Note: If there are special circumstances (medical issues, family emergency, etc.) that prevent you from turning in an assignment by the given deadline, please let me know as soon as possible. I will work with you to find an acceptable solution.

Academic Honesty

All submissions must represent the work of the submitting team or individual. It is permissible to discuss the assignment with other students, but you must develop the solution yourselves. Do not, under any circumstances, copy another person’s program and submit it as your own. Writing any material (whether it be code, English text, or other) for use by another or using another’s work as your own, in any form (even with their permission), will be considered cheating. Cheating on an assignment or exam, including attempts to subvert the course infrastructure, will result in an **automatic zero grade** for that piece of work, and the initiation of disciplinary action at the University level.

Ethics

Some of the technical material studied in this course might be useful for doing things that violate university regulations, laws, or common standards of ethical behavior. Any such behavior that comes to the instructor’s attention will be reported to appropriate authorities. In particular, note that use of university computing resources is governed by the Office of Information Technology’s Acceptable Use Policy, which may be found at http://oit.pdx.edu/aup/. Use of any techniques learned in this course to harm others will be reported to the authorities for prosecution to the fullest extent of the law.