Syllabus: Advanced Network Security

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1 Course Number

633.

2 Course Title

Advanced Network Security.

3 Credits

4.

4 Term, place, time, instructor

Although subject to student demands as any other course, this course is planned to be offered once every two years, typically in Spring term. The instructor for this course will be Prof. Jun Li (lijun@cs.uoregon.edu) from the Department of Computer and Information Science (CIS).

5 Place in Curriculum

This course serves as an advanced course for graduate students who would like to explore more advanced topics in computer networking. This course falls under the Systems and Networks cluster and can serve as a cluster course for Master degree requirement or Ph.D. degree requirement. Both a Master student and a Ph.D. student need 12 credits of cluster courses. Graduate students can also take this course as an elective.

The prerequisite of this class will be CIS 533 Computer and Network Security, or instructor approval.

6 Format

Lecture and Discussion.

7 Outline of Subject and Topics Explored

Computer networks, such as the Internet, enables different entities to exchange vast quantities of information and share remote resources. Unfortunately, networking also poses a danger by exposing individuals to various forms of network-based attacks, raising ever-growing concerns as computer networks become more common and more relied upon.
This course is designed for students to learn both classic and state-of-art research topics and also solve some research problems they are interested. Topics will include vulnerabilities in computer networking (e.g. the Internet), threats and attacks exploiting the vulnerabilities, algorithms and mechanisms for preventing, detecting and recovering from such attacks, as well as the measurement and evaluation of everything aforementioned.

8 Course Materials

Selected readings reflecting both classic and hot topics.

9 Expectations for Students

- Student Engagement Inventory

<table>
<thead>
<tr>
<th>Educational activity</th>
<th>Hours student engaged</th>
<th>Explanatory comments (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course attendance</td>
<td>30</td>
<td>2 lectures a week, 1.5 hours per lecture</td>
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<tr>
<td>Assigned readings</td>
<td>60</td>
<td>2 papers a week, estimated 3 hours per paper</td>
</tr>
<tr>
<td>Project</td>
<td>50–80</td>
<td>a student needs to work on a class project with approximately 5–8 hours a week on average</td>
</tr>
<tr>
<td>Writing assignments</td>
<td>20–30</td>
<td>class notes, presentation preparation, and class project reports at different stage</td>
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<tr>
<td></td>
<td></td>
<td>(a proposal, an intermediary report, a final report); about 2–3 hours a week on average</td>
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<tr>
<td>Lab or workshop</td>
<td></td>
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<td>Field work/experience</td>
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<td>Online interaction</td>
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<tr>
<td>Performance/creative activities</td>
<td></td>
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<tr>
<td>Total hours:</td>
<td>160–200</td>
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</tbody>
</table>

Table 1:

- Course attendance. Students should actively participate in the class (laptop usage is forbidden unless used to make class notes), including raising questions and being involved in discussions.

- Reading and pop quiz. Students should carefully prereview the class materials before the class. At the beginning of some lectures, the instructor will use 2–4 pop quizzes to test every student’s understanding of readings assigned to a lecture.

- Project. Either individually or with a team, every student is required to work on a class project that addresses an open issue in computer network security. They need to demonstrate their skills in identifying an interesting research problem and solving it with at least certain amount of novelty.

- Writing. At each lecture students should take notes that they can use for their after-class review of what they learned. 2–3 notes for some lectures need to be handed in in a typed form.

The students will also need to write class project reports at different stage: a 1-page proposal due in the second week, a 2-page intermediary report due in the fifth week, and a 10-page final report due in the final week.

- Presentation. Every student will briefly present their project ideas in the second week, a bit more time on their progress in the fifth week, and do the final project presentation in the tenth week.

- Tests No tests.
10 Assessment

• Methods: Students will be evaluated based on their performance in the classroom and their performance in working on their class project. The classroom performance includes their participation, their quiz scores, and the class notes they turned in later. The project performance includes their presentations and reports at different stage and the intellectual merits of their work.

• Times or frequency: See Section 9 above for times and frequency of the pop quizzes, class notes, presentations, and reports.

• Grading policy:

<table>
<thead>
<tr>
<th>Class performance:</th>
<th>Class participation 10%</th>
<th>Pop quiz 10%</th>
<th>Class notes 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class project:</td>
<td>Presentation 20%</td>
<td>Report 20%</td>
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<tr>
<td>Overall research merits 15%</td>
<td>Individual contribution 15%</td>
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</table>

11 Academic Dishonesty

For this course, all work must be done individually, except for the class project. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented, including those from your classmates.

The student conduct code allows an instructor to impose an appropriate sanction for a student found guilty of academic dishonesty, up to and including an N or an F.

For more information on academic honesty, please talk to the instructor or see the Student Conduct Code at http://arcweb.sos.state.or.us/rules/OARS_500/OAR_571/571_021.html.

12 Universal Learning Environment

The University of Oregon is working to create inclusive learning environments. Please notify me if there are aspects of instruction or design of this course that result in barriers to your participation.

(Students with a UO disability notification letter should please meet with me at their earliest convenience during the first two weeks of the term. You may also wish to contact Disability Services in 164 Oregon Hall at 346-1155. For information about Support and Services for Students with Disabilities, see the Disability Services web page (http://ds.uoregon.edu/).)