Fall 2013

CEG 4400/6400-01: Computer Networks and Security

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Departmen11t of Computer Science and Engineering  
Wright State University

CEG4400/6400 Computer Networks and Security  
SYLLABUS  
Fall 2013

Drop dates: 9/20 (in-person), 9/22 (online) no grade; 10/25 (in-person), 10/27 (online) with a W  
Last day of class: December 7

Time/Place  
Section 1: 4:40-6:00pm, 4 credits, M, W Health Science Bldg 140  
Section 90 online section

Instructor  
Dr. Bin Wang, Professor, 491 Joshi Research Center  
Tel: (937) 775-5115, E-mail: send email via Pilot  
Office hours: 3:00-4:00pm M, W, or walk-in

TA  
Shiva Bhupathiraju 326 Russ Engineering Center  
E-mail: bhupathiraju.2@wright.edu  
Office hours: 3:00-4:00 pm, T, Th; Lab: Russ 346, 6:10-8:00pm M

Prerequisites  
The contents covered are self-contained. Background in networking is not required.  
CEG 3310 (Computer Org) and proficient in Java, C, C++;  
Programming experience in Java, C, C++;  
Program development tools: editors, compilers, linkers, debuggers;  
Data structures: arrays, stacks, queues, lists, and binary trees.

Textbooks  

Webpage  
http://pilot.wright.edu

News Group  
Check daily Pilot for announcements, assignments, homework, questions and answers.

Course Objectives  
This course provides an introduction to basic concepts of communication networks and network security, different types of networks, protocols over different layers, applications, and security issues, through lectures, labs, homework, and reading on relevant materials. You will

- Understand networking principles, protocols, and technologies.
- Understand design and performance issues involved in providing network services.
• Acquire background for supporting e-commerce, e-government, and e-education.
• Gain hands-on experiences through implementation of simple network protocols.
• Preparation for research or taking advanced courses in computer networks and security.

Students' Responsibilities
You are expected to:
1) read assigned materials prior to class and come up with questions. Reading materials will be assigned in advance.
2) attend classes on a regular and timely basis. Regular class attendance is mandatory and is essential to success in the course. You are responsible for all contents, handouts, and announcements distributed/made in class.
3) complete and turn in your assignments timely. You are expected to write your own programs. Do not copy from or give your work to others, and do not make it possible for others to copy any portions of your work. Violators will receive a zero credit on the assignment.
4) be present for exams at the scheduled times. If there is a catastrophic event that prevents you from taking an exam, please contact the instructor as soon as possible.
5) not disturb/disrupt the class.
6) consult with the instructor and/or graduate teaching assistant if you have questions regarding course contents, lectures, handouts, or other problems.

Course Evaluation
You will receive a final course grade comprised of the weighted scores earned on all required course assignments and exams.

Methods: % of final grade

1. Participation (show up, in class discussion, in class quizzes, etc): 4%
2. Labs and Projects: 30%
3. Homework: 16% (6 homework)
4. Middle term exam: 20% (10/14, Monday in class)
5. Final exam: 30% (12/9, Monday, 5:45-7:45pm)

Total 100%

Grading scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
</tr>
<tr>
<td>B</td>
<td>83-92.9</td>
</tr>
<tr>
<td>C</td>
<td>73-82.9</td>
</tr>
<tr>
<td>D</td>
<td>63-72.9</td>
</tr>
<tr>
<td>F</td>
<td>&lt;63</td>
</tr>
</tbody>
</table>

Undergraduates and graduates will be graded separately.
Re-grading policy: If you have questions about the way an assignment or exam is graded, you must detail the rationale for re-grading.
Late Submission of Assignments

You may discuss assignments with classmates but all solutions must be original and individually prepared.

You will lose 10% of the total points for an assignment for each 24-hour period (or fraction of a 24-hour period) the assignment is late. Late assignments will be accepted up to 4 days after the due date as specified in the assignment handout. Late penalty is accrued on weekends just as during the week. Partial credits will be given to students who turn in partially completed assignments.

Special considerations will be given for students who have a medical excuse for late submission (written proof of illness is required). These considerations may extend to medical emergencies involving children or other family members. Such consideration is at the discretion of the instructor, and will be as reasonable and fair as possible. Special consideration may also be given for employment conflicts (e.g., military duty, travel) if brought to the attention of the instructor prior to the due date for an assignment.

Course requirements for other courses are NOT a valid reason for special consideration.

Missed Exams

Missed quizzes cannot be made up. Missed exams can be made up only under extenuating circumstances such as medical emergencies and work conflicts as mentioned above. Please see the instructor as soon as possible if you know you will be unable to attend an exam. You are expected to schedule your departure for any end of quarter travel after your final exam.

Plagiarism

Students are members of a learning community committed to the search for knowledge and truth. Essential to that search is the faithful adherence by all students to the highest standards of honesty and integrity. A grade of “0” or “F” will be assigned to examinations or assignments on which cheating, plagiarism or any other form of academic dishonesty is committed or determined to have occurred. For the detail, see Wright State University Student Handbook under “Academic Dishonesty”.

Lecture Outline

The following is the tentative lecture schedule.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics/Activities</th>
<th>Text Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction: computer networks and the Internet</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>2</td>
<td>Basic networking concepts (Lab 1)</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>3</td>
<td>Application layer protocols: principles and QoS requirements, representative application layer protocols (DNS, HTTP) (Lab 2)</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>4</td>
<td>Representative application layer protocols (ftp, email, p2p, etc) (Lab 3)</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>5</td>
<td>Transport layer: UDP (Project 1 due; estimated)</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>6</td>
<td>Transport layer: principle of reliable transfer (sliding window protocol; selective repeat) (Lab 4)</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>7</td>
<td>Transport layer: TCP, reliability, flow control (midterm exam)</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>8</td>
<td>Transport layer: TCP, congestion control (Lab 5)</td>
<td>Chapter 3</td>
</tr>
<tr>
<td>9</td>
<td>Network layer and routing: IP, IP addressing; Routing algorithm: link state routing (Lab 6)</td>
<td>Chapter 4</td>
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<tr>
<td></td>
<td>Routing algorithm: distance vector; IP packet forwarding</td>
<td>Chapter 4</td>
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<tr>
<td>11</td>
<td>Link layer: Error detection and correction techniques; Media access control (multiple access) protocols (Lab 7) (Project 2 due; estimated)</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>12</td>
<td>LAN: LAN addresses and ARP, Ethernet, Hubs, Bridges, Switches; PPP, wireless LAN (Lab 8)</td>
<td>Chapters 5,6</td>
</tr>
<tr>
<td>13</td>
<td>Network security: Symmetric key, public key cryptography, hash function, MAC, digital signatures (Lab 8)</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>14</td>
<td>Network security applications: secure E-mail, PGP, SSL, IPsec, VPN, WEP, 802.11i</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>15</td>
<td>Firewalls and intrusion detection (course review, evaluation of instruction)</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>16</td>
<td>Final exam</td>
<td></td>
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</tbody>
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