

# COMP7311/8311: Advanced Computer Networks – Spring 2008

Prof. Lan Wang

4pm – 5:25pm, Monday/Wednesday, DH203 (may move to FIT324)

## Contact Information:

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## Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
	3-4pm		3-4pm	
<i>Also by Appointment</i>				

## Course Description:

**COMP 7311/8311.** Internet architecture and layering; intra-domain and inter-domain routing protocols; congestion control; network QoS; peer-to-peer networks; overlay networks; wireless and sensor networks. PREREQUISITE: COMP 6310.

### Why this course?

1. To have a solid understanding of various networking research areas;
2. To understand the design and implementation of existing and new network protocols;
3. To inspire you to design the next -generation Internet;

## Resources:

### Required Text

“Routing in the Internet,” 2nd Ed. by Christian Huitema, (Prentice Hall, ISBN 0-13-022647-5).

### Recommended Text

1. “Computer Networking: A Top-Down Approach Featuring the Internet (3rd Edition)”, by James F. Kurose, Keith W. Ross, Addison Wesley, 2004
2. “TCP/IP Illustrated”, *Volume 1 (The Protocols)*, by W. Richard Stevens, Addison-Wesley, ISBN 0-201-63346-9
3. “TCP/IP Illustrated”, *Volume 2 (The Implementation)*, by Gary R. Wright and W. Richard Stevens, Addison-Wesley, ISBN 0-201-63354-X
4. “Internet Routing Architectures”, 2nd Edition by Sam Halabi and Danny McPherson, Cisco Press, ISBN 1-57870-233-X

### Other Resources: (Journal / Conference papers, websites, etc)

Google scholar: <http://scholar.google.com/>

CiteSeer: <http://citeseer.ist.psu.edu/>

Conferences: <http://www.ee.unsw.edu.au/~timm/netconf/> ACM SIGCOMM, IEEE INFOCOM, ACM SIGMETRICS, IEEE ICNP, USENIX SECURITY, NDSS, NSDI, ACM MOBICOM

## Evaluation:

### Class Participation

Participating in class discussion is a very good way to learn. You can earn up to 12 points for class participation (0.5 point/class). You earn 0.5 point if you are active in a class (e.g. asking and answering questions). If you do not attend a class, you get 0 point for that class.

### Homework

You can choose 8 out of the 10 assignments to work on and earn up to 24 points for them (3 points/homework). If you do more than 8 assignments, you can earn up to 3 points for each additional homework submission. Your classmates will rate your homework and the median of their ratings will be your score. Please be fair and objective when you rate other people's work. If I detect any anomalies, you will not be eligible to rate others' work any more.

*All the homework submissions should be single space, single column and the font size should be 11pt. The margin on each side should be 1 inch (the main text is 6 inch by 9 inch).*

### Presentations

You will give 2 team presentations (60 minutes for each team) and earn up to 6 points for each presentation. Each team can have at most 2 people. You should prepare 15 to 20 slides with at least 1/2 of them containing graphs/tables/graphics. Please email me your slides 24 hours before class so that I can give you some feedback. There may be a pop-up quiz at the end of each presentation.

### Midterm

Midterm will be on Mar. 26. It will cover all the material taught before that class. The test is open book and lasts 90 minutes.

### Term Project

1. Project proposal (due midnight Feb. 15, 3+ pages): 5 pts
2. Project progress report (due midnight Mar. 14, 4+ pages): 5 pts
3. Project presentation and demo (Apr. 23 in class): 7 pts
4. Final report (due midnight May 2, 8+ pages): 15 pts

*The project proposal and reports should be 11pt font, single space, double column and IEEE transactions style (see <http://www.ieee.org/portal/pages/pubs/transactions/stylesheets.html> for instructions). I prefer that you use Latex for all submissions (homework, proposal and reports).*

**Each team will give a 5-minute presentation after submitting proposals and progress reports.**

### Final Grades

Class Participation	12%	Presentations	12%
Homework	24%	Midterm Exam	16%

Term Project	30%	Bonus*	6%
Quizzes	8%		

### Grading Scale (subject to change)

A+: 94, A: 90, A-: 87, B+: 84, B: 81, B-: 79, C+: 75, C: 72, C-: 68, D+: 64, D: 60, F: < 60.

### Course Policies:

#### Attendance

You are required to attend every class unless there is *a documented medical emergency*. I will check attendance at the beginning of every class. To prove emergency condition, please submit a doctor's note or other proof of the emergency (e.g. receipt from a car repair shop).

#### Late Policy

Homework is due *before class on the due date*. Reports are due *midnight on the due date*. Please submit all your homework and reports to Jake Qualls (jake.uofm@gmail.com). Any homework or reports submitted after the deadline will **NOT** be accepted.

#### Testing Policy

There will **NOT** be any makeup quizzes or exams unless there is *a documented emergency*. To prove emergency condition, please submit a doctor's note or other proof of the emergency (e.g. receipt from a car repair shop).

#### Plagiarism/Cheating Policy: (These paragraphs are mandatory.)

***Plagiarism or cheating*** behavior in any form is unethical and detrimental to proper education and ***will not be tolerated***. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but ***appropriate references must be included for the materials consulted***, and appropriate citations made when the material is taken verbatim.

**If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: <http://www.people.memphis.edu/~jaffairs/>**

## Course Syllabus

*List lecture topics or chapter sections by week or lecture meeting days (subject to change).*

Week	Lecture Topics
1	Course Overview, Internet History, IPv4
2	Internet Architecture (End-End Principle, etc.)
3	IPv6, intra-domain routing (RIP, OSPF)
4	Quiz 1, inter-domain Routing (EGP, BGP)
5	New Routing Design and Routing Security (HLP, SBGP), Proposals
6	Domain Name System and DNS Security (DNS, DNSSEC)
7	Quiz 2, TCP Congestion Control and Active Queue Management
8	Spring Break
9	Wireless Sensor Networking
10	Quality of Service (Intserv, Diffserv, RSVP, VoIP)
11	DoS Attacks and DoS Mitigation Strategies
12	Internet Worms, Midterm
13	Peer-to-Peer Networks (DHT, Tapestry)
14	Quiz 3, Mobile Computing (Mobile IP, etc)
15	Project Presentations, Demo