CS 413 Advanced Networking, Winter 2020

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Text: Comer, *Internetworking with TCP/IP*, Volume 1, Prentice
Hall, **6th Edition**

5ᵗʰ Edition is fine

Grades will be based on 2 tests, projects and lab reports. Written reports must be
typed. Lab reports must be submitted by the assigned due dates and follow the correct
format. Late work will only be accepted if approved in advance. Quizzes may be given at any
time.

On Time Attendance is required for labs and group presentations.

In addition to lab reports, keep a journal of all labs. Bring the journal to all labs, and
record your activities, questions that may arise from the lab, and insights you may gain
as a result of the lab. This journal should be updated as the lab progresses. It forms the
basis from which you then write your lab report. You may be asked to turn in your lab
journal.

Normally, cell phones, tablets and lap tops may not be used during class. Be prepared to take
notes some other way. There is significant research that indicates that taking notes in writing by
hand (cursive) is much more effective than taking notes other ways.

Lecture Outline

I. Review of OSI model

II. Host level protocols
   1. Based on OSI model
   2. Based on TCP/IP

III. Internetworking
   1. The Internet
   2. Internets
   3. Bridges
   4. Gateways
   5. Routers

IV. Addresses
   1. Internet model

V. Mapping logical to physical addresses
   1. Direct mapping
   2. Dynamic binding
   3. ARP

VI. Diskless workstations addresses at startup.
   1. Reverse ARP

VII. IP-Connectionless Datagrams
   1. Unreliable delivery
   2. Connectionless delivery
   3. Purpose of IP protocol

VIII. Routing
   1. Internet routing
   2. Indirect routing
   3. Table driven routes
   4. Host specific routes

IX. Error and Control Messages
1. ICMP message format and delivery
2. Testing reachability
3. Flow control

X. Protocol Layering
1. Need for layering
2. Disadvantages of layering

XI. TCP/IP Transport and Application Level Protocols
1. Reliable Stream Transsort
2. Telnet
3. Rlogin
4. FTP
5. SMTP

XII. Network Management

For any email you send me it should be easy to identify you and the purpose of your email from the name in the from field and the contents of the subject field which should include **CS 413.** If not, your email will probably be discarded as spam.

Goals

The goals of this class are to study and learn the details of a specific network protocol (TCP/IP versions 4 and 6). Students will demonstrate their understanding through lab exercises, homework and tests.

Students will also learn how to use a network protocol to develop applications. This will be demonstrated by the completion of programming projects.

Commitment to Viewpoint Diversity, Mutual Understanding, and Constructive Disagreement

In order to create a classroom environment that supports respectful, critical inquiry through the free exchange of ideas, the following principles will guide our work:

All students who seek to learn the course material, work hard and respect each other are welcome in this class.

Treat every member of the class with respect, even if you disagree with their opinion;

Reasonable minds can differ on any number of perspectives, opinions, and conclusions;

Because constructive disagreement sharpens thinking, deepens understanding, and reveals novel insights, it is not just encouraged, it is expected;

All viewpoints are welcome; No ideas are immune from scrutiny and debate;

You will not be graded on your opinions.