Computer Networks and Applications

COMP 3331/COMP 9331

Course Outline & Logistics

Today's Agenda

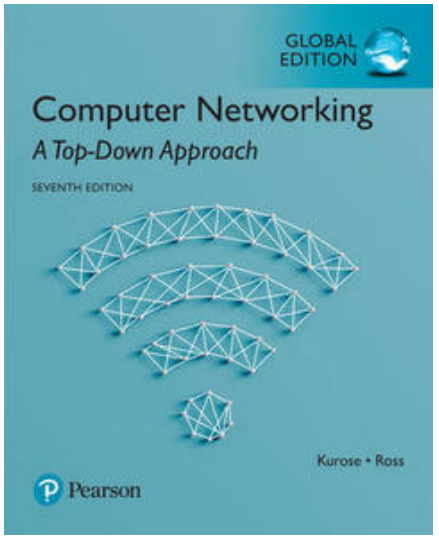
- Course (non-technical) details
- Logistics: How we will roll
- What is this course about?
- Introduction t s (Chapter 1)

WebCMS Portal

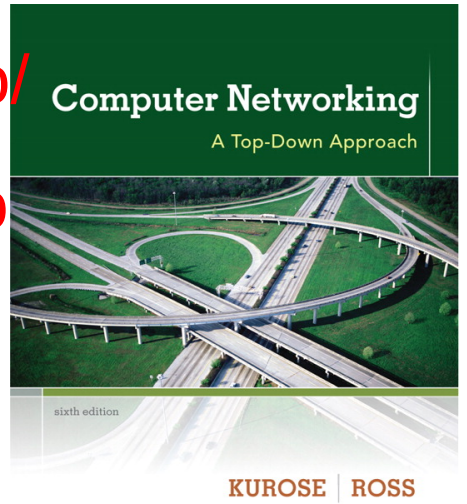
- https://webcms3.cse.unsw.edu.au/COMP3331/18s2/
- Everything is posted on the course website
  - **Course Outline (PLEASE READ THIS THOROUGHLY)**
  - Lecture Notes
  - Video Recordings
  - Lab Schedules, A
  - Assignment and Lab Exercises
  - Homework Problems
  - Consultation hours
  - Announcement: Your responsibility to check the announcement forum on regular basis for important updates/changes to schedule, etc.
  - Nothing will be handed out in the class
  - **Your active participation and interaction is crucial to ensure that all of us get the most out of this course**

Very important

Course Material



- *Computer Networking: A Top Down Approach*, Jim Kurose, Keith Ross, Addison-Wesley(Pearson), 7th Edition, 2016 (6th Edition will suffice for most of the part).
- Lecture Notes (on WebCMS)
- Links/articles on ad
- Reference Books:
  - *Computer Networks: A Systems A* Peterson and Bruce Davie, Morga Fourth Edition, 2007.
  - *Unix Network Programming Volume 1 - Networking APIs: Sockets and XTI*, W. Richard Stevens, Prentice Hall, Second Edition, 1998 (Third edition also available)
  - *Java Network Programming*, E. R. Harold, O'Reilly, Third Edition, 2004.
- Links to programming help



Course Aims

- To gain in-depth introduction to a wide range of topics in the field of computer networks, including the Internet
- To obtain han f networking protocols
- To gain skills in network p ng, designing and implementing network protocols, evaluating network performance and problem solving
- To build necessary foundational knowledge required in more advanced networking courses
  - You will gain problem solving skills

Teaching/Learning Strategies

- Lectures (12 weeks, 3-hr per week)
- Labs (7 of them)
  - Hands-on learning
- Assignments (1, due Week 12)
  - Basic network programming ol design
  - C or Java or Python
- Weekly Homework (Self-assessed)
  - Problem solving skills

Lectures

- Lectures (12 weeks, 3-hr per week)
- We will focus on most important concepts and supplement with
  - Problem solv
  - Discussions
  - Additional material
- Certain material will be left for self study
  - These will be indicated on the lecture notes

Labs

- 2 hour lab sessions starting **Week 2**
- Hands-on experiments related to concepts that you learn in lectures
  - Wireshark packet sniffer, ns-2 network simulator, other network measurement tools
- 9 lab sessions:
  - 7 Lab Exercise
    - Some are *s* s *demonstration*
    - 5 best performing labs out of for assessment
    - Lab Report to be submitted a the day of your lab
    - Highly encouraged to attempt lab tasks before attending labs
    - Demonstrate select labs to the tutors
  - 2 Tutorials (Week 5 & 12)
    - Help with problem solving
    - Prep for exams
- Strongly encouraged to work in pairs (but individual submissions only)

Assessment

- Hands-on – 40%
  - Labs 20%
  - Assignment 20%
    - Single assignment due in 12th Week
    - Implement a networking software (C/Java/Python)
- Concepts and th
  - Mid-session test (20%)
    - In Week 6 (includes material f o Week 5)
    - Closed-book MCQ
    - Negative marking enforced to deter random attempts
  - Final Exam (40%)
    - Closed-book written exam, End of semester
    - Critical thinking and problem solving questions
    - Hurdle component – must obtain at least 40% to clear

Assessment

NOTE: To pass the course, a student MUST receive at least 40% marks on the final exam

lab = marks for lab exercises (scaled to 20)
assign = mark for the programming assignment (scaled to 20)
midExam = mark for the mid-semester exam (scaled to 20 marks)
finalExam = mar marks)
mark = lab + assi
grade = HD|DN|CR|PS if mark >= xam >= 16
= FL if mark < 50 || final

NOTE: If you cannot clear the final exam hurdle, the maximum marks reported will be 40/100

Getting help

- Use discussion forum for labs, assignment, and other matters at WebCMS
  - Fellow students benefit from your questions
  - Fellow students can answer your questions
  - Develop a community
- Please avoid em h as possible; you may be directed l
- Consultation hours
  - LiC for lecture-related help - 2 hours each week
  - Lab consultation hours for lab and programming related help

Accounts for accessing lab machines

- Use your zid/zpass to log into CSE computers
- New to UNSW - https://it.unsw.edu.au/students/zpass/index.html
- You will be auto ent to the course website. Log on

Be original !!

- Collaboration
  - You may discuss approaches, not solutions
  - You must submit your own work
  - We strongly
- Plagiarism
  - Zero tolerance, don't do it

https://my.unsw.edu.au/student/academiclife/Plagiarism.pdf
https://student.unsw.edu.au/plagiarism

What is this course about ?

- Introductory (first course) course in computer network
  - Learn *principles* and *practice* of computer networking

- We use the Internet as a vehicle to understand the core concepts of

What is this course about ?

1. To learn how the Internet works
   - Internet is a complex global infrastructure
   - What are the organising principles behind the Internet?
   - What really h… se the Web"?
   - What are TC… VPNs, 802.11,…. anyway?

What is this course about ?

1. To learn how the Internet works
   - Internet is a complex global infrastructure
   - What are the organising principles behind the Internet?
   - What really happens when you "browse the Web"?
   - What are TCP, VPNs, 802.11,…. and

2. To learn the fundamentals of computer networks
   - What issue you need to take into consideration to make a computer network work well?
   - What design strategies have proven valuable?
   - How do we evaluate network performance?

Why learn the fundamentals?

- Applicable to all computer networks
- Help you design new types of networks

- Change/reinventi
  - Today's Internet ay's
  - And tomorrow's will be differe
  - But the fundamentals remain the same

Pictures: http://medicineworld.org/, Wikipedia

Nano-scale computer networks?

- 1 nm = 10^{-9} m = 1/25000 diameter of a human hair
- Network of nanorobots to sweep the coronary plaque

Pre-requisites

- Good understanding of algorithms, data structures and basic probability
- Proficient in programming: C, Java or Python

Where do I go from here?

- COMP 9332: Network Routing and Switching
- COMP 9333: Advanced Computer Networks
- COMP 9334: System Capacity and Planning
- COMP 3441/9441
- COMP 4335/9335 sor Networks
- COMP 4336/9336: Mobile Data
- COMP 4337/9337: Securing Wireless Networks
- COMP6733: Internet of Things
- Thesis Projects
- Research (Master's, PhD)