

Computer Networks and Applications

COMP 3331/COMP 9331

LIC: Sanjay Jha
Networked Systems and Security Group
CysPri Lab

Course Outline & Logistics

Today's Agenda

- Course (non-technical) details
- Logistics: How we will roll
- What is this course about?
- Introduction to Computer Networks

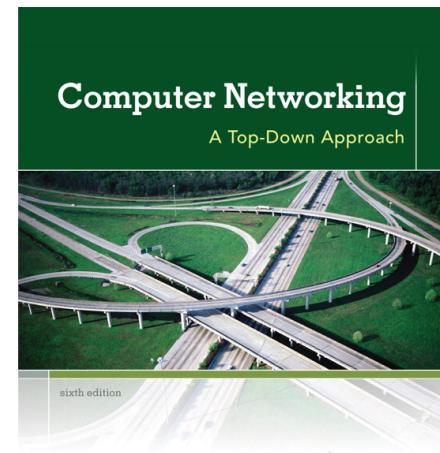
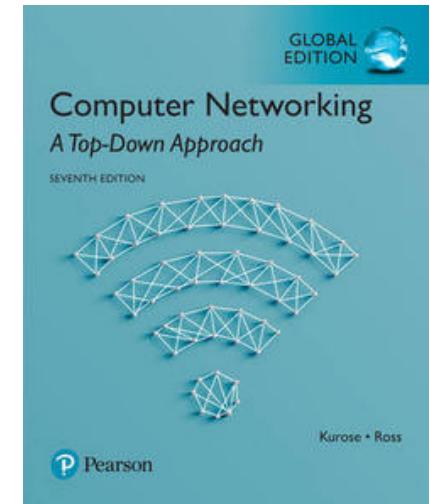
Website

- <https://www.openlearning.com/unswcourses/courses/COMP9331>
- Log in to Moodle and find COMP3331/9331 and click on access OpenLearning
- Everything is posted on the site
 - **Course Outline (PLEASE READ THIS THOROUGHLY)**
 - Weekly Activities
 - Lecture Notes
 - Video Recordings
 - Lab Schedules, Allocations and Locations
 - Assignments and Lab Exercises
 - Sample Problems
 - Information about Exams
 - **Announcement:** Your responsibility to check this from time to time (1-2 times per week) for important updates/changes to schedule
 - **Your active participation and interaction is crucial to ensure that all of us get the most out of this course**

Very important

Course Material

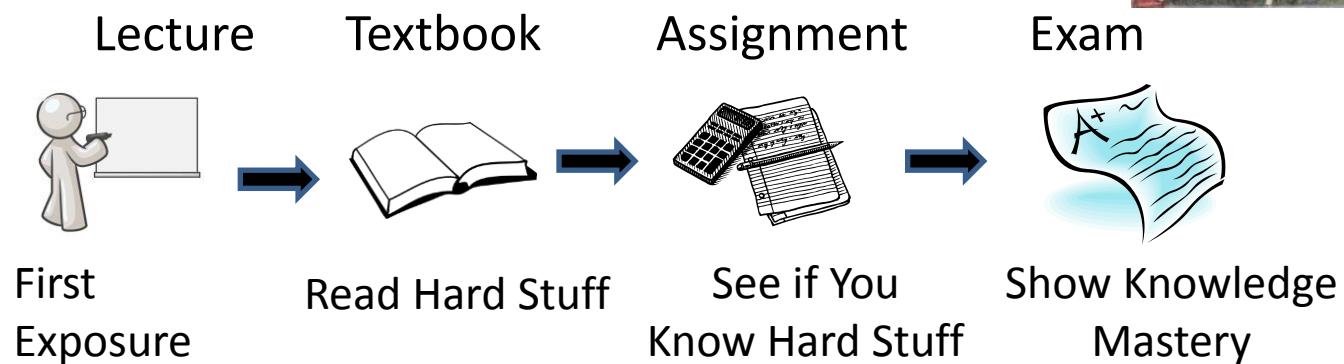
- *Computer Networking: A Top Down Approach*, Jim Kurose, Keith Ross, Addison-Wesley(Pearson), 7th Edition, 2016.
- Lecture Notes + Activities (on OpenLearning)
- Links/articles on OpenLearning
- Reference Books:
 - *Computer Networks: A Systems Approach*, Larry Peterson and Bruce Davie, Morgan Kaufmann, Fourth Edition, 2007.
 - *Unix Network Programming Volume 1 - Networking APIs: Sockets and XTI*, W. Richard Stevens, Prentice Hall, Second Edition, 1998 (Third Edition is out this year)
 - *Java Network Programming*, E. R. Harold, O'Reilly, Third Edition, 2004.
- Links to programming help on OpenLearning



Teaching Strategies

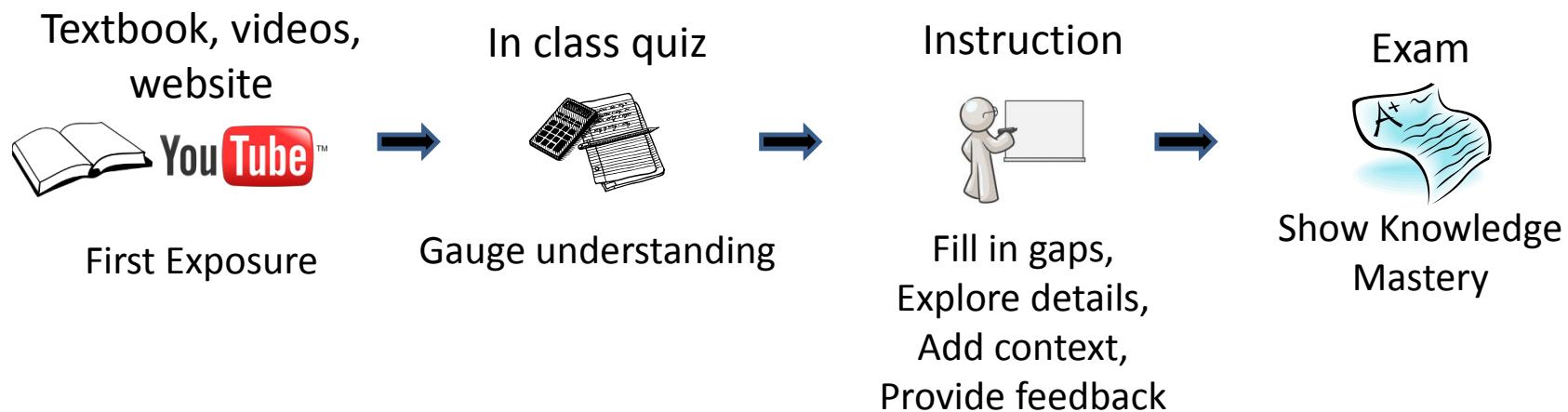
- Lectures
- Labs
 - Hands-on learning
- Assignments
 - U learn basic network programming and protocol design
 - C or Java or Python
- Sample Problems + Activities
 - U will gain problem solving skills

Traditional Lectures



- Little opportunity for expert feedback and deeper insights

Interactive Classes with Peer Instruction



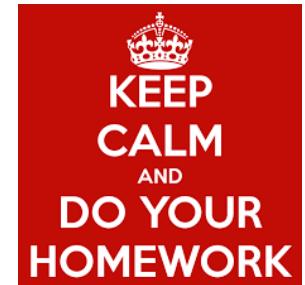
- Parts of the lecture will be reserved for interactive, customized experiences
- Research on how people learn:
 - Everyone constructs their own understanding
 - To learn, you must actively work with a problem and construct your own understanding of it



Blended Learning

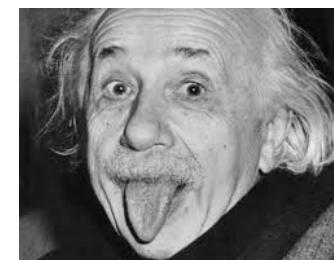
- Activities for the following week will be released every **Wednesday** (after the 2nd lecture)
- Please go through the activities and participate, discuss with other students, ask questions, etc.
- In the lectures we will focus on **the most important concepts** and supplement with the following:
 - problem solving exercises
 - quizzes,
 - live demos
 - discussions





Implications

- You will have to come prepared to the lecture by completing activities
- You will have to actively participate during lecture
- Certain (simpler) parts of the content will be left for you to read on your own
- You will get candy !!
- And we will all become incredibly knowledgeable !!





Quiz: The most useful super power for a UNSW student would be:



A

Invisibility

B

Lots of \$\$\$

C

Telepathy

D

Weather

E: Some other power (be prepared to discuss)

Labs

- 2 hour lab sessions starting **Week 2**
- Hands-on experiments using several networking tools to understand protocol behaviour and evaluate network performance and practice programming
- 9 lab sessions:
 - 7 Lab Exercises:
 - Marked
 - Lab Report to be submitted one week after your lab
 - 2 Tutorials (Week 5 & 12)
 - Help with problem solving
 - Prep for exams
- Schedule/exercises on the course web page
- Please attend in your scheduled slot
- Strongly encouraged to work in pairs (but individual submissions only)

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 automatically added as a student to the course website. Log on using zid/zpass

Getting help



- LiC's consultations
 - Consult Openlearning
- Lab tutors
- Your fellow students
- **OpenLearning– BEST OPTION**
 - Fellow students benefit from your questions
 - Fellow students can answer your questions
 - Develop a community
 - I am very active



Assessment

Component	Weight
Labs	20%
Programming Assignments	20%
Mid-semester Exam	20%
Final Exam	40%

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 = marks for the two programming assignments (scaled to 20)

midExam = mark for the mid-semester exam (out of 20 marks)

finalExam = mark for the final exam (out of 40 marks)

mark = lab + assign + midExam + finalExam

grade = HD|DN|CR|PS if mark $\geq 50 \ \&\& \text{ finalExam} \geq 16$

= FL if mark $< 50 \ || \text{ finalExam} < 16$

Be original !!



WRITE YOUR OWN GOD DAMNED CONTENT!

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



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



More about exams

- Mid-semester Exam (**20 marks**)
 - In-class during normal lecture hours (date/venue:Consult Openlearning)
 - Includes material from Week 1 – Week 5
- Final Exam (**40 marks**)
 - Final Exam Period
 - Comprehensive coverage but emphasis on 2nd half of the course
- Both exams – **Closed book**
 - Critical thinking and problem solving questions
 - Not a memory test
 - Sample problem set released every 2 weeks
 - Please attempt these on your own, discuss with friends, forum
 - Solutions will be made available
 - Practice problems during lectures + plenty of activities

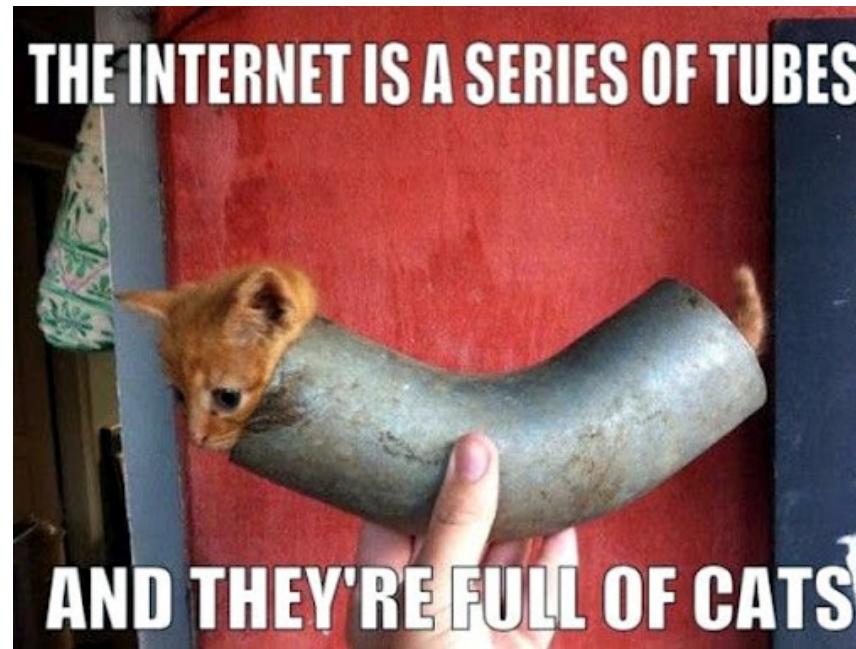
Pre-requisites



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

What is this course about ?

- This is a first course in computer networks
- We use the Internet as a vehicle to understand the core concepts of networking



What is this course about ?



1. To learn how the Internet works

- What really happens when you “browse the Web”?
- What are TCP/IP, DNS, HTTP, NAT, VPNs, 802.11,... anyway?

What is this course about ?

1. To learn how the Internet works
 - What really happens when you “browse the Web”?
 - What are TCP/IP, DNS, HTTP, NAT, VPNs, 802.11,... anyway?

2. To learn the fundamentals of computer networks
 - What hard problems must they solve?
 - What design strategies have proven valuable?
 - How do we evaluate network performance?

Why learn the fundamentals?

- Applicable to all computer networks

- Intellectual interest

- Change/reinvention

- Today's Internet is different from yesterday's
- And tomorrow's will be different again
- But the fundamentals remain the same



Where do I go from here?

- COMP 9332: Network Routing and Switching
- COMP 9334: System Capacity and Planning
- COMP 3441/9441: Security Engineering
- COMP 4336/9336: Mobile Data Networking
- COMP 4337/9337: Securing Wireless Networks
- COMP6733: Internet of Things Experimental Design Studio
- A series of new security courses
- Thesis Projects
- Research (Master's, PhD)