

# Computer Networks

Introduction

Jianping Pan  
Spring 2017

# About this course

- Computer Communicationss and Networks

- ↳ lectures: TWF 8:30—9:20am, ECS125

- ↳ <http://connex.csc.uvic.ca/>

- Tab “CSC361: 201701 A01”: lectures, labs, resources, etc

- ↳ prerequisites: *a message\* from Undergrad Advisor...*

- Algorithms and Data Structures: II (CSC225 or **226**)

- Computer Architecture (**CSC230** or CENG255)

- Software Development Methods (**SENG265**)

- ↳ ***strongly recommended!***

- Introduction to Operating Systems (**CSC360**)

# Course materials

- Required textbook

- James F. Kurose and Keith W. Ross,  
**Computer Networking: A Top-Down Approach**,  
Addison Wesley, ***Fourth Edition or newer*** \*.

- *older than 4<sup>th</sup> edition **NOT** acceptable*

- what if you have other textbook?

- do get a copy of this book, 6<sup>th</sup> or 7<sup>th</sup> edition

- Explore further

- web links @ course website

- /., IETF, USENIX, ACM, IEEE, ..., and Google!

# Course schedule and topics

- First month
  - ↳ network architectures: mainly the Internet (**IPS**)
  - ↳ application layer: mainly **HTTP** and **DNS**
- Second month
  - ↳ transport layer: mainly **TCP** and **UDP**
- Third month
  - ↳ network layer: mainly **IP addressing** and **routing**
  - ↳ link layer: **logic link** control, **media access** control
- See course website for details

# Course evaluation

- One written assignment (5%)
  - out: Jan 16; in: Jan 23; returned: before Jan 30
- Two programming assignments (45%)
  - H 20% and 25%, respectively
  - H out: Jan 16 and Feb 20
  - H in: Feb 10 and March 24
- Three in-class midterm exams (50%)
  - H 15%, 20%, 15% each; closed book and notes
  - H on Jan 31, March 7 and April 4, respectively

# Course policies

- See official course outline on connex->Lectures
  - late assignments, mark appeals, etc
  - ***academic integrity: we treat it very seriously***
  - accommodation, etc
- No group assignments
  - collaboration/participation is encouraged
  - responsibility: your submitted work is yours
    - protect your own work too!
  - obligation: give credits to all references

# What is this course *really* about?

- It's about **FUN**

- ↳ It's *Fun to Understand Networks*

- Why is it fun?

- ↳ we're already using networks everyday

- it's really cool to know the things underneath

- ↳ almost all computer systems now are networked

- it's really important for EECS students to know networks

- ↳ strong job market for network-proficient people

- impress your next interviewer, or just your grandma

- ↳ computer networks => network science

- transport, social, biology, business networks, etc

# What's exciting in lectures?

- Now offered as a third-year networks course
  - ↳ to respond to the requests from students/employers
  - ↳ heavily redesigned from the original CSC450/550
  - ↳ the process started (by now) 11 years ago \*
- Focusing on TCP/IP networking
  - ↳ how your home network works?
  - ↳ how the Internet works? and the things in between
- How can we make it more fun?
  - ↳ “Explore further” questions, now showing in lab too!
  - ↳ hands-on experience in labs



# More systems/networks courses!

- Wireless Mobile Networks (CSC463)
- ***Advanced Computer Networks (CSC466)***
  - ↳ overlay and peer-to-peer networking
- Advanced Communication Networks (CSC467)
- **Networking degree option in CS/SENG**
  - ↳ <http://tinyurl.com/uvicnetopt>
- ***Real-time/Embedded Systems (CSC460)***
- Multimedia Systems (CSC461)
- Distributed Systems (CSC462)

# About the course instructor

- Dr Jianping Pan

✉ pan@uvic.ca, x5796

✉ office hours: TTh 9:30—10:30am, ECS566

- or by appointment

✉ work experience

- UVic prof, industry labs researcher, UWaterloo postdoc
- redesigned csc361 and its “new” lab; first offered in 2008

✉ research area

- computer networks and distributed systems
- <http://web.uvic.ca/~pan>

# About the lab instructors

- Dawood, Maryam, Huan and Bingshan\*
  - ↳ PhD candidates/students, focusing on computer networks, software-defined radio/networking, etc
- Lab starts next week!
  - ↳ check WebTT for your lab time/location
  - ↳ problems to register? Let me know!
    - **New challenges this term: 8 lab sections!**
  - ↳ if you have more flexibility, please consider to
    - trade a seat with those who have time conflict
    - but need to be official in the system (cscadvisor)

# What's exciting in labs?

- Brand new labs and tutorials\*
  - ↳ better sync-ed with course lectures
  - ↳ new, hands-on experience
- Network traffic analysis
  - ↳ Ethereal/Wireshark
  - ↳ see real packets on the wire!
- Experiment in a real network
  - ↳ Cisco/Linksys WRT54GL with OpenWRT
  - ↳ capture your own packets off the wire!



# Too challenging for you?

- We are here to help
  - H connex and crosscourse
    - get help and help others!
  - H *CSC consultant clinic (now mainly for 1xx courses)*
    - 2nd floor, ECS building
  - H your lab instructors
    - make the best out of your lab hours
  - H your course instructor
    - in class, during office hours, or by appointment
- A quick google often can help as well!

# Suggested approaches

- Before lectures
  - ↳ read required sections in textbook
  - ↳ write down your questions
- Attend lectures
  - ↳ take notes, ask questions
- After lectures
  - ↳ explore further, get help and help others
- Attend lab tutorials
  - ↳ start assignments early!

# *Common mistakes*

- “The slides are already out there”
  - ↳ slides intended to be ***brief*** as a guide map
  - ↳ a lot of details, discussion, questions and answers only appear in class and on blackboard
  - ↳ attending lectures is essential
- “I will do my assignments on the due date”
  - ↳ simple fact: you cannot finish (and even start) it
  - ↳ understand the spec, design, implement, improve...
  - ↳ starting early is essential

# Too easy for you?

- We have something more challenging for you!

• <http://www.csc.uvic.ca/competitions> and UVic records

- ACM ICPC (programming contest): 3<sup>rd</sup> in US/Canada PacNW
- ACM SRC (student research competition)
- BCNET BIC/DMC (network applications): 1<sup>st</sup> place in BC
- IEEE Extreme (online programming competition): 3<sup>rd</sup> in Canada
- IEEE ComSoc: Communication technology changing the World
- NSERC USRA (undergrad research award, CPR only)
- UVic JCURA (undergrad research award, all students)
- and many more ...
- ***UVIC CSC483A: Competitive Programming***



# NSERC USRA

- Undergraduate Student Research Awards

- ↳ awards allocated to our dept every year

- deadline for Summer/Fall 2017 to come soon

- ↳ get a taste of doing research

- a good experience before graduation, going to graduate school, or committing to a research career

- ↳ impress your next job interviewer

- can be used as Co-op work term as well

- ↳ see some networks projects or propose yours

- <http://www.cs.uvic.ca/~pan/usra>

# Course Representative

- We need three Course Reps!
  - maybe four reps with such a big class
  - interact with the students attending this course
    - voice their concerns
  - meet with course/lab instructors regularly\*
    - help us do better
- AAA: aggregate, anonymize, amplify

# Assignment 0

- Due on Friday, January 6, 2017
- From *you@uvic.ca* to *pan@uvic.ca*

✉ Subject: [csc361] A0

- name, student #, academic program; no csc360 yet?
- things you already know about networks
- things you want to know more about networks
- what and how's your home Internet access?
- interested in ACM/IEEE, NSERC USRA, JCURA?
- any issues with logistics? volunteer for course rep?
- a URL to your favorite mugshot

✉ let me know you as well! for reference letters later etc

# Next lecture

- An overview on computer networks
  - read K&R: Computer Networking
    - Chapter 1 (except 1.6)