TELE 3118: Network Technologies

Session 1, 2017

Announcements

- 25 May: There are no lectures scheduled for Week 13.
- 22 May: Project demonstrations will be held on Friday 2 Jun from 10:30am - 4:30pm in EET-343. Please consult the project page for the time-slot when your group demo is scheduled.
- 22 May: Please complete course/teaching evaluations at MyExperience
- 18 May: The UDP server code is now available on the project page. Please test your client by running the server locally, before testing against the server running on host 149.171.37.122.
- 23 Apr: The tutorial for this Monday 24 Apr is cancelled. All students are urged to attend the tutorial next Monday 1 May.
- 23 Apr: Specifications for the programming mini-project are now available.
- 05 Apr: There will be no lab on Friday 14 Apr on account of Good Friday holiday. All students enrolled in odd-week labs will be affected, and are requested to go to the even-week lab this Friday 7 April instead. Note that there will be no make-up labs, so if you are affected by the Good Friday holiday please go to this week's lab session as indicated.
- 05 Apr: The tutorial on Monday 10 Apr is cancelled in view of the mid-session test in lecture that day.
- 20 Mar: Lecture video recordings are now available on Moodle.
- 27 Feb: Labs and tutorials will start in week 2.

Course Outline (handout)

Course Convenor, Lecturer, and Tutor: Prof. Vijay Sivaraman
Lectures: Mon 2pm-4pm (TETB-LG05) and Thu 5pm-6pm (TETB-LG03)
Tutorials: Mon 4pm-5pm (TETB-G15)
Consultation: Mon 5pm-6pm
Lab Demonstrators: Mohammadh Chinaei and Iresha Udayangani
Labs: Fri 12pm-3pm (odd and even weeks) and Tue 2pm-5pm (odd weeks). All labs will be held in ElecEng-343A.

Aims: This course aims to develop a fundamental understanding of the architecture of data communication networks such as the Internet. It will introduce students to the layered communication protocol stack (referred to as the TCP/IP stack in the Internet context), and progressively work through the functions and technologies at the various layers. Topics covered will include the physical medium, medium access mechanisms, IP addressing and routing, TCP congestion control, and applications such as email, web, and DNS. Particular emphasis will be given to the engineering design choices that have helped shape today's Internet.

Text and Resources: We will be using the text by James F. Kurose and Keith W. Ross Computer Networking: A Top-Down Approach, Global Edition (7e), Pearson Higher Ed, 2016. As an additional reference the book by Andrew S. Tanenbaum and David J. Wetherall, Computer Networks, 5th edition, Pearson, 2010, will be used.

Assessment:

Labs and mini-project	30%
Mid-session test	30%
Final exam	40%
In-class Quizzes	Discretionary

Course Structure (Tentative and Subject to Change)

Week	Monday	Thursday	Reading/Homework	Labs	Tutorials
1	27 Feb: Introduction: Internet Technologies	02 Mar: Physical Layer	Reading: Chapter 1; Sections 7.1,7.2. Homework: Ch1: R4, R15, R16, R23, P6, P8, P19.		
2	06 Mar: Data Link Layer: Framing and Errors	09 Mar: Data Link Layer: MAC	Reading: Sections 6.1,6.2,6.3. Tanenbaum section 3.2. Homework: Ch6: R4, P5, P7, P11, P13.	Ethernet cabling	Tutorial 1
3	13 Mar: Data Link Layer: Wireless and Ethernet	16 Mar: Data Link Layer: Switching	Reading: Sections 6.4,6.6,7.3.		
4	20 Mar: Network Layer Data Plane: Basics, Addressing	23 Mar: Network Layer Data Plane: Routers	Reading: Sections 4.1,4.3,4.2.	Ethernet Switching	Tutorial 2
5	27 Mar: Network Layer Data Plane: Forwarding	30 Mar: Network Layer Data Plane: IPv6, SDN	Reading: Sections 4.3.3,4.3.5,4.4,6.4.1.		
6	03 Apr: Network Layer Control Plane: IGP Routing	06 Apr: Network Layer Control Plane: BGP Routing	Reading: Sections 5.2,5.3,5.4,5.5.	IP and ICMP	Tutorial 3
7	10 Apr: **Mid-Session Test**	13 Apr: Guest lecture on SDN	Sample Test		
-	*14 Apr - 23 Apr: Mid-session break*				
8	24 Apr: Network Layer Control Plane: SDN and SNMP	27 Apr: Mid-term exam discussion	Reading:	Internet Routing	Tutorial 4
9	01 May: Transport Layer: Basics, UDP	04 May: Transport Layer: TCP basics	Reading: Sections 3.1,3.2,3.3.		
10	08 May: Transport Layer: TCP congestion control	11 May: Transport Layer: TCP fairness	Reading: Sections 3.5,3.6,3.7.	TCP	Tutorial 5
11	15 May: Application Layer: Basics, HTTP	18 May: Application Layer: SMTP, P2P	Reading: Sections 2.1,2.2,2.3		
12	22 May: Application Layer: DNS and CDNs	25 May: Review and Future Courses	Reading: Sections 2.4,2.5,2.6	Mini-project	Tutorial 6
13	29 May: No class	01 Jun: Project Demos	Reading: Sample Exam		

Relevant Previous Courses

- TELE3118 in session 1, 2016.