ECE361H1 F/S	Computer Networks I	

3/1.50m/1m/0.50

III,IV-AECPEBASC, III,IV-AEELEBASC,
IV-AEESCBASER

Layered network architectures; overview of TCP/IP protocol suite. Introduction to sockets; introduction to application layer protocols. Peer-to-Peer Protocols: ARQ; TCP reliable stream service; flow control. Data Link Controls: Framing; PPP; HDLC. Medium access control and LANs: Aloha; Ethernet; Wireless LANs; Bridges. Packet Switching: Datagram and virtual circuit switching; Shortest path algorithms; Distance vector and link state algorithms.

Prerequisite: STA286H1 or ECE302H1
Corequisite: ECE302H1. (Students must take the co-requisite, ECE302H1 in the same term as ECE361H, OR in a term before taking ECE361H1.)

Course objective: The objective of this course is to teach the basic concepts of computer network architectures and techniques for solving problems and designing protocols that arise in computer engineering practice.

Required textbook: A. Leon-Garcia and I. Widjaja, *Communication Networks: Fundamental Concepts and Key Architectures*, First Edition, McGraw-Hill 2000.

Instructors: A. Leon-Garcia (BA 4120; alberto.leongarcia@utoronto.ca) and Ben Liang (BA 4122) .

Teaching assistants: Erfan Meskar (e.meskar@mail.utoronto.ca), Amirreza Ramtin (amirrezaramtin@gmail.com), Kristina Dzeparoska (kristina.dzeparoska@mail.utoronto.ca), Simona Marinova (simona_marinova@hotmail.com), Morteza Moghaddassian (m.moghaddassian@mail.utoronto.ca), Rajsimman Ravichandiran (rajsimman.ravichandiran@mail.utoronto.ca),

Lectures: LEC101: MF noon; Wed. 1pm, GB119, GB 221, GB119;
LEC102, MWTh, 5pm, 4pm, 3pm, GB119. GB120, GB110

Labs: PRA101/102, Fri 9am, PRA103/104, Tu. 3-6pm, GB243;

Tutorials: TUT 101/102 Tu noon, GB404/HA403; TUT103 MFri 2 pm HS103

Evaluation scheme: term test, 30%; final, 50%; labs 15%; Tutorial participation 5%.

ECE 361	Computer Networks	Winter 2018		
Professor	A. Leon-Garcia, Bahen 4120, alberto.leongarcia@utoronto.ca (LEC 102) Ben Liang, BA 4122, liang@comm.utoronto.ca (LEC 101)			En
TAs	Erfan Meskar (e.meskar@mail.utoronto.ca), Amirreza Ramtin (amirrezaramtin@gmail.com), Kristina Dzeparoska (kristina.dzeparoska@mail.utoronto.ca), Simona Marinova (simona_marinova@hotmail.com), Morteza Moghaddassian (m.moghaddassian@mail.utoronto.ca), Rajsimman Ravichandiran (rajsimman.ravichandiran@mail.utoronto.ca),			
Textbook	*Communications Networks: Fundamental Concepts and Key Architectures, McGraw-Hill, First Edition,* by Leon-Garcia & Widjaja + Online materials			
Mark Distribution	Term Test (Date TBD)	30%	Closed Book; Formulas Provided	
	Participation in Tutorial (Attendance)	5%		
	Labs (Labs 3 pts each, drop the lowest)	15%		
	Final Exam	50%	Closed Book; Formulas Provided	
Tutorial	TA guides students through selected homework-related exercises; Homework solutions will be posted weekly			
Lab	Students will work in teams of 2; students are free to form teams from the same lab section.			
Time & Place	LEC101: MF noon; Wed. 1pm, GB119, GB 221, GB119; LEC102, MWTh, 5pm, 4pm, 3pm, GB119. GB120, GB110 PRA101/102, Fri 9am , PRA103/104, Tu. 15:00-18:00am, GB243; TUT 101/102 Tu noon, GB404/HA403; TUT103 MFri 2 pm HS103			

Date	Lecture Topic (MWF)	Reading	Tutorial (M)	Lab (TFr)
The schedule is subject to change because of unexpected events such as class cancellations, snowstorms, etc.				
January 1, 2018	**WEEK 1**			
January 1, 2018 January 3, 2018 January 4, 2018	Introduction to Computer Networks; Course Overview	Read 1.2	No Tutorial	No Lab
January 8, 2018	**WEEK 2**			
January 8, 2018 January 10, 2018 January 12, 2018	Circuit Switching and Packet Switching Layered Network Architectures TCP/IP Architecture Overview	Read 2.1-2.3	Layered Architectures	
January 15, 2018	**WEEK 3**			
January 15, 2018 January 17, 2018 January 19, 2018	HTTP Voice over IP; RTP and UDP Berkeley Sockets		TCP/IP	PRA02/04 Lab #1 Wireshark Exercises
January 22, 2018	**WEEK 4**			
January 22, 2018 January 24, 2018 January 26, 2018	Digital Transmission Communications Media Error Detection: Check Sums & Polynomial Codes		Bit Rates, Propagation Delay, Message Delays	PRA01/03 Lab #1 WireShark Exercises
January 29, 2018	**WEEK 5**			
January 29, 2018 January 31, 2018 February 2, 2018	Stop-and-Wait ARQ Go-Back-N Selective ARQ		Error Detection & S&W ARQ	PRA02/04 Lab #2 TCP/IP Utilities Read Sedtion 2.5
February 5, 2018	**WEEK 6**			
February 5, 2018 October 9, 2012 February 9, 2018	TCP Reliable Stream Service and Flow Control Packet Buffering and Statistical Multiplexing Packet Delay and Packet Loss Models		ARQ Performance	PRA01/03 Lab #2 TCP/IP Utilities Read Section 2.5
February 12, 2018	**WEEK 7**			
February 12, 2018 February 14, 2018 February 16, 2018	Framing: HDLC, PPP, and Ethernet Aloha Random Access CSMA/CD & CSMA/CA		Statistical Multiplexing	PRA02/04 Lab #3 UDP Sockets
February 19, 2018	**WEEK 8 Reading Week**			
February 19, 2018 February 21, 2018 February 23, 2018				
February 26, 2018	**WEEK 9**			
February 26, 2018 February 28, 2018 March 2, 2018	Ethernet LANs Spanning Tree Protocol & VLANs WIFI LANs		MAC	PRA02/04 Lab #4 TCP Sockets
March 5, 2018	**WEEK 10**			
March 5, 2018 March 7, 2018 March 9, 2018	Router and Switch Design Routing Tables: Datagrams & Virtual Circuits Packet Scheduling and Quality of Service		Ethernet & WIFI LANs	PRA01/03 Lab #3 UDP Sockets
March 12, 2018	**WEEK 11**			
March 12, 2018 March 14, 2018 March 16, 2018	MPLS and SDN Network Layers Distance Vector Routing		Routers & Switches	PRA02/04 has Lab #5 OpenFlow Pt-Pt & Multipoint Circuits
March 19, 2018	**WEEK 12**			
March 19, 2018 March 21, 2018 March 23, 2018	Link-State Routing OSPF and BGP IPv6 and CIDR		Routing Protocols	PRA01/03 Lab #4 TCP Sockets
March 26, 2018	**WEEK 13 March 30, 2018 (Good Friday)**			
March 26, 2018 March 28, 2018 March 30, 2018	DHCP and NAT TCP Congestion Control		TP & IP Topics	
April 2, 2018	**WEEK 14**			
April 2, 2018 April 4, 2018 April 6, 2018	Cryptographic Algorithm Overview Security Protocols TLS & HTTPS		Security Protocols	PRA01/03 has Lab #5 OpenFlow Pt-Pt & Multipoint Circuits
April 9, 2018	**WEEK 15**			
April 9, 2018 April 11, 2018	Guest Speaker: Service Provider Networks Review			