

III,IV-[AECPEBASC](#), III,IV-[AEELEBASC](#),
IV-[AEESCASER](#)

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.

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