Instructor:
Professor C. Huang
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http://www.sce.carleton.ca/faculty/huang.html

Prerequisites:
SYSC 2510 or STAT 2605 or STAT 3502 (may be taken concurrently), and third-year status in Biomedical and Electrical, Electrical, Communications, Computer Systems, Software, or Sustainable and Renewable Energy Engineering.

Students who have not satisfied the prerequisites for this course must either a) withdraw from the course, or b) obtain a prerequisite waiver online at www.sce.carleton.ca/dept/us/academics/support/forms, or c) will be deregistered from the course after the last day to register for courses.

Course Description:

Learning Outcomes:

- Know the concepts of circuit switching, packet switching, virtual circuit network, and datagram network
- Know the layered structure and functions of each layer
- Understand how to calculate different types of delay in packet switching network
- Know properties of different types of physical media
- Know different multiplexing techniques
- Understand how error detection and correction work and how to estimate error detection probability
- Know how point-to-point link work
- Know how different types of LANs work
- Understand how to calculate performances of LANs
- Understand how to find shortest paths using routing algorithms
- Know different routing protocols
- Know how TCP/IP works
- Understand how to use NS3 to simulate different types of networks and its limitations
- Understand how to use Traceroute, Wireshark to get information about a network


References:

TCP/IP Illustrated, Vol. 1, W. R. Stevens, Addison-Wesley, 1994


http://www.ietf.org

Marking Scheme:

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<tr>
<td>Attendance</td>
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<tr>
<td>Labs.</td>
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<td>4 Assignments</td>
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<td>Mid-Term exam</td>
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<td>Final Exam</td>
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Deadline Policy:

A minimum of one week, but normally ten days, will be allowed for completion of all assignments. Late assignments will not be accepted. All assignments shall be submitted online.

Class Schedule:

11:35am-12:55pm, Tuesday and Thursday, ME3380.

Checking Marks:

Lists of term marks will be posted on dates to be announced. It is each student’s responsibility to check that marks are correct or report any errors by the specified deadline.

Laboratory:

L1O: 2:35pm -5:25pm, Wednesday, CB5109
L3O: 2:35pm -5:25pm, Tuesday, CB5109

Final Exam: Is for the evaluation purposes only and will not be returned to the student.

Academic Integrity and Academic Accommodation:

Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Undergraduate Calendar for additional information.
The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Laboratory Health and Safety Manual:


Review Week:

Accreditation of our Engineering programs requires that classes and laboratories, tutorials, or problem analysis sessions continue to run through the review period of the fall term. For 2017, the last day of normally scheduled classes falls on December 8, 2017.

Course Schedule:

0) Course arrangements, scope etc.

1) Protocols, services, and layering. OSI model and TCP/IP architecture.
   Lab hours: PA 1

2) Physical media, multiplexing, access networks. Issue Ass.1

3) Data link controls, error detection, PPP.
   Lab hours: PA 2 and Lab 1

4) MAC, random access, Aloha, CSMA, CSMA/CD, scheduling. Ass. 1 due. Issue Ass. 2.

5) LAN protocols, Ethernet, WiFi.
   Lab hours: PA 3 and Lab 2

6) Bridges, Switches. Ass. 2 due. Midterm (or week 7)

7) VLAN and data center networks.
   Lab hours: PA 4 and Lab 3.

8) Network layer, datagram vs. virtual circuit networks, MPLS. Issue Ass 3.

9) Routing in packet networks.
Lab hours: PA 5 and Lab 4.

10) IP, ARP, DHCP, CIDR, ICMP. Ass. 3 due. Issue Ass. 4.

11) Internet routing protocols, RIP, OSPF, BGP.
    Lab hours: PA 6 and Lab 5

12) TCP/UDP overview. Ass. 4 due. Term marks will be posted. Request for correction of errors must be received before Final Exam.