CS357: Computer Networks I

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(http://www.csd.uwo.ca/faculty/elsakka/COURSES/2002-M05-M06-CS357a/index.html)

EXPECTATIONS

Did you ask yourself

- Why am I taking this course?
- What do I expect from this course?

Some Suggested Answers

- Knowing more about World Wide Web
  - What is the internet and how does it work?
  - What do the terms HTML, HTTP, URL, and CGI mean?
  - What are the differences between a web server and a web browser?
  - What is the relationship between Java and the internet?
- Knowing more about email
  - How does it work and how can I create a mailing list?
  - What do the terms MIME and SMTP mean?
  - What are the differences between POP and IMAP?
- Knowing more about FTP
  - How can I make an ftp server?
  - What are the differences between FTP, TFTP, and NFS?

- Knowing more about telnet and rlogin
  - What are the differences between them?
- Knowing more about network management
  - What does the term SNMP mean?
  - How can I design a network?
  - How can I configure/initialize a network?
  - What does the network performance means?
- Knowing more about network security
  - Viruses
  - Firewall
  - Encryption

- Knowing more about communication hardware
  - Serial communication
  - Parallel communication
  - Modem
  - Network components
  - Network topology
- Knowing more about data representations
  - How are data encoded?
  - How are encoded data changed automatically from one computer to another?
  - How can data travel across the network with almost no error?

- Knowing more about network protocols
  - What does a protocol layer mean?
  - How many layers exist in computer networks?
  - How does the IP addressing work?
  - What is IPng?
  - What is IPv6?
  - What is TCP/IP?
- Knowing more about internetworking
  - How does a message travel from one end (source) to the other end (destination)?
  - How does a message find out its route?
  - How can more than one computer share the same media (MAC)?
  - How can the tens of millions of existing computers talk to each other?

Summary of Suggested Answers

I would like to take CS357 to know more about

- World Wide Web
- Email
- FTP
- Telnet and rlogin
- Network security
- Network management
- Communication hardware
- Data representations
- Network protocols
- Internetworking

Course Description

Computer networks have been growing explosively. Networking is used in every aspect of business, including advertising, production, shipping, planning, billing, and accounting.

This course tries to answer the question, "How do computer networks and internet operates?". It emphasizes basic principles and topics of fundamental importance concerning the technology and architecture of this field, as well as providing some discussions of leading-edge topics.

Topics To Be Covered During The Course

- Transmission Media
- Local Asynchronous Communication
- Long-Distance Communication
- Packets, Frames, and Error Detection
- LAN Technologies and Network Topology
- LAN Wiring, Physical Topology, and Interface Hardware
- Hardware Addressing and Frame Type Identification
- Extending LANS: Repeaters, Bridges, and Switches
- WAN Technologies and Routing
- Network Ownership, Service Paradigm, and Performance
- Delivery Control, Flow Control, and Congestion Control

- Network Protocols and Layering
- TCP/IP: An Overview
- Internetworking Concepts
- Internet Protocol Addresses
- Address Resolution Protocol (ARP)
- IP Datagrams and Datagram Forwarding
- IP Encapsulation, Fragmentation, and Reassembly
- Classless InterDomain Routing (CIDR)
- Subnetting
- The Future IP (IPv6)
- Internet Control Message Protocol (ICMP)
- TCP: Transport Layer Protocols
- Additional topics, if time allows

Prerequisites

- CS 208a/b (Fundamentals of Computer Organization)
- CS 210a/b (Data Structures and Algorithms)
- CS 211a/b (Software Tools and Systems Programming)
- Familiarity with Unix

The University said:

Students are responsible for ensuring that they have successfully completed all course prerequisites and that they have not taken an anti-requisite course. Lack of prerequisites may not be used as the basis of appeal. If a student is not eligible for a course, he/she may be removed from it at any time, and will receive no adjustment to his/her fees. These decisions can not be appealed.

If a student does not have the course prerequisites, and has not been granted a special permission to take the course by the department, it is his/her best interest to drop the course well before the end of the add/drop period.

Students prompt attention to this matter will not only help protect their record, but will ensure that spaces become available for students who require the course in question for graduation.

Textbook

Computer Networks and Internets
3rd Edition
By Douglas E. Comer
Prentice Hall, 2002

- Most of the first three parts from the text book will be covered during this course, i.e.,
  - PART I: Data Transmission
  - PART II: Packet Transmission
  - PART III: Internetworking

References

Internetworking with TCP/IP, Volume 1
4th Edition
By Douglas E. Comer
Prentice Hall, 2000

Computer Networks
3rd Edition
By Andrew S. Tanenbaum
Prentice Hall, 1996

Data and Computer Communications
6th Edition
By William Stallings
Prentice Hall, 2000

The internet itself!!!
For example, look at the Internet Requests For Comments (RFCs),
http://www.rfc-editor.org

Assignments

- 5 weekly-assignments
- Usually assignments will be posted on Friday afternoon
- Assignments are due on Wednesday at 8:30 AM in the CS 357 locker No. 103, MC building, ground floor (beside the elevator)
- Late assignments are strongly discouraged
  - 20% will be deducted for one late day (24 hours)
  - After that day, late assignments will not be accepted
- Note that, a late assignment must be put in the CS357 locker no more than 24 hours after the deadline
- Do not forget to include the assignment submission form with your submission; this form requires that students declare that the assignment is their own work and affix their signature

Tentative Assignment Schedule

Assignment No.	Out Date	Duration	Due Date
1	Friday, May 17	5 days	Wednesday, May 22
2	Friday, May 24	5 days	Wednesday, May 29
3	Friday, May 31	5 days	Wednesday, June 5
4	Friday, June 7	5 days	Wednesday, June 12
5	Friday, June 14	5 days	Wednesday, June 19

Assignment Marking

- Assignments will be marked by the TA, Saverio (Serge) Cinelli
- Every effort will be made to have assignments marked and handed back within 2 weeks of the handing date, or sooner
- You are responsible for picking up your marked assignment within the one week following the first handed-back day
- Any assignments not picked up within this one week will be directed to the recycling bins
- You should direct any questions about marking in the first instance to your TA, and then to the course instructor if the discussion with the TA is not satisfactory
- A request for an adjustment in an assignment mark must be made within one week following the the first handed-back day. All assignment marks are considered to be final after that date, even if you did not pick up the assignment

Grading

- 25 marks: assignments
- 25 marks: midterm exam
  When: Monday June 3, 2002 from 10:00 am to 11:00 am
  Where: Soc Sci 2036
- 50 marks: final exam
  When: Monday June 24, 2002, from 9:00 am to 12:00 pm
  Where: Soc Sci 2036
- To pass this course, you must
  - Get at least 50 marks in the assignments + exams, and
  - Get at least 38 marks in the final + the midterm exams

All marks on assignments/midterm are considered to be final one week after the graded assignment/midterm is handed back in class, even if not picked up. Any grad adjustments must be requested in that one week interval.

Plagiarism

- Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).
- Independent work is required on each Assignment. You may discuss approaches to problems among each other. However, the actual details of the work (assignment coding, answers to concept questions, etc.) must be an individual effort.
- Assignments that are judged to be the result of academic dishonesty will, for the student's first offence, be given a mark of zero with an additional penalty equal to the weight of the assignment also being applied
- Students are responsible for reading and respecting the Computer Science Department's policy on *Scholastic Offences* and *Rules of Ethical Conduct*

Study Questions

- From time to time (most likely each weekend, or each other weekend), I will post a collection of short-answer study questions
- These questions will be posted to help you to study the material
- NOTE THAT: these questions are not a part of the assignments, i.e., you will not be asked to submit the answers, and there is no marks assigned to these questions
- If you find that you are not able to answer these questions, then go back to the text book and the lecture notes and restudy them
- DO NOT email me these questions, this is because I will not answer them!!!!

Office Hours

- Mahmoud El-Sakka
  Middlesex College Room 419
  - Office hours:
    - Wednesday from 1:00 p.m. to 2:00 p.m.
    - Friday from 12:00 p.m. to 1:00 p.m.
  - Otherwise, by a specific appointment
  - You may send your question(s) via email, but do not expect an immediate response!!!
- Saverio (Serge) Cinelli
  Middlesex College Room 4a
  - Office hours:
    - Monday from 12:00 p.m. to 1:00 p.m.
    - Tuesday from 12:00 p.m. to 2:00 p.m.
    - Wednesday from 12:00 p.m. to 1:00 p.m.
  - Otherwise, by a specific appointment
  - You may send your question(s) via email

Your Email Address

- Occasionally, email messages may be sent to the whole class, or to students individually
- Email will be sent to your GAUL email address
- You must make sure that you read your email on GAUL on a frequent and regular basis, or have it forwarded to an alternative email address if you prefer to read it there

Course Materials

- All materials will be posted through the course web page, http://www.csd.uwo.ca/faculty/elsakka/COURSES/2002-M05-M06-CS357a/index.html i.e., no hardcopy will be passed to you
- These materials include
  - Course outline
  - Lecture notes
  - Assignments
  - Study questions
  - Marks
- Note that lecture notes will be:
  - Available through the course web page *after* the lecture
  - Posted in *Postscript* and *PDF* format, both in full and *psnp4* sizes
- Please always check the *What's New* section to know what's new in the web page

Some of Your Concerns

- The availability of lecture notes on the web
  - *Before* versus *after* the lecture!!
- Socket programming and network applications
  - Are they included in the course or not?
- Why do we have all these assignments?
  Is not a couple of them enough?
  - You should consider assignments as a way to let you understand parts of the material
  - Tell me and I might forget
    Show me and I might remember
    Involve me and I might understand (*Chinese Proverb*)
  - Do not let assignments take your marks away,
    i.e., please do not neglect assignments
  - Do not copy assignment solutions from each other, i.e., be honest
- What are my major research areas and specialties?

Some of My Concerns

- Feedback is very important for any system to be stable;
  - I always encourage feedback
  - Do not assume that I know what is going inside your mind, i.e., if you have a concern regarding CS357, please let me know it
- Questions during lectures are welcome; just rise your hand!!!
- It is important to attend lectures
  - Some extra materials, which are not in the textbook, are addressed in lectures from time to time
  - Some hints about assignments are given during lectures
- BTW: you do not have to send me your email address;
  the department will provide me with a mailing list for CS357 after the add/drop period

The quiz of the day

Please answer each question in 1 or 2 sentences:

- What was the most useful, or meaningful, thing you learned or insight you gained during this session?
- What was the "muddiest" point, i.e., the least clear point, in this session?

Note that:

- What I hear, I forgot
- What I see, I remember
- What I do, I understand