

CSE 5346/4346: High Performance Networks (Networks-II)

Spring 2008

Short Course Description:

The course will be research and implementation oriented, with a focus on topics such as high-performance networks like ATM and Gigabit Ethernet, network performance modeling, quality of service protocols in IP networks, voice-over-IP, mobile agents, and mobile networks.

Prerequisites:

- CSE 5344
- C and C++ programming knowledge

Instructor: Gergely Záruba

- Office: 113 GABC
- Phone: (817) 272-3602
- Office hours: Mondays and Wednesdays 3:00pm – 3:50pm
(other consultations by appointment only.)
- Instructor's e-mail: zaruba@uta.edu
- GTA: Hyun J. "Stella" Choe email: choe@uta.edu
Office hours: Mondays and Thursdays 2:30pm – 3:30pm in NH 239

Objectives:

Course objective is to provide an in depth understanding of several key topics important in modern communications networks, including the Internet.

Outcomes:

The student who successfully completes this course will have an in depth understanding of several current and highly relevant topics and their instantiation in modern computer networking, will gain experience in network performance modeling/analysis, and will be prepared to apply his/her knowledge toward further studies and research in the networking field.

Details of Curriculum:

- Class WWW site: <http://crystal.uta.edu/~zaruba/CSE5346/>
Note: Please check WWW site for up to date information
- Class mailing list address: CSE5346-ZARUBA@LISTSERV.UTA.EDU
Note: students need to sign up for the mailing list of the class during the first week of classes, by either 1) sending an email (with the body containing only their names) from their preferred account with the subject: "CSE-5346 sign-up"; or 2) by going to the listserv (<http://listserv.uta.edu> and following links or by clicking the link on the class website) page and requesting there to join the class mailing list.
- Text Book: *High-Speed Networks and Internets: Performance and Quality of Service*, Second Edition, William Stallings, Prentice Hall, 2002 (ISBN: 0-13-032221-0) plus (Internet drafts, papers, publications, WWW documents, Instructor's notes)
- A detailed schedule can be found at the end of this document

Details of Class Policies:

Course Grades:

Course grades will be based on the following:

- Projects: 30%
 - Project assignments are due on the day indicated in the class schedule (see need of this document). Projects must be submitted via email and in hardcopy as described in the assignment document. Electronic submissions must be time-stamped before the class period on the due date, or late policy grading applies (see below). Hardcopy submissions will be due and collected at the beginning of the class period on the due date. Work submitted after the end of class will be considered late.
 - Late submissions will receive 10% (of the total possible grade) deduction right after the exact due time. They will also be amortized 20% (of the total possible grade) each day after the assignment was due.
- Quizzes: 20%
 - Several short quizzes (about 5) will be given throughout the semester to measure learning progress. Quizzes will typically be given during the final 10-20 minutes of the class period. The schedule for quizzes indicated in the class schedule may be adjusted at the discretion of the instructor based on the pace of topics covered. The worst quiz for each student will be dropped, and the rest will count in a uniformly distributed weight manner to the grade.
 - Quizzes cover all material presented/assigned generally since the previous quiz however may include components of previous material as well), up to and including assigned reading for class on the day of the quiz. Format will be True/False, multiple choice, fill-in-the-blank, numerical problems solving, and very brief essay questions. Certain quizzes *may* (i.e., there is a chance that they are but they are not by default) be open book, so students need to have their own textbook (no sharing) with them in class on quiz days.
 - There will be no make-up, or early quizzes.
- Exam-1: 25%
 - There will be one subject matter exam approximately at mid-semester covering topics addressed prior to that point. One-hour and 15 minutes will be allotted for the exam, and it will begin promptly at the beginning of the class period during which it is scheduled.
 - There will be no make-up, or early exams.
- Exam-2: 25%
 - There will be a second exam covering topics since the first exam at the end of the semester. One-hour and 15 minutes will be allotted for the exam, and it will begin promptly at the beginning of the class period during which it is scheduled.
 - There will be no make-up, or early exams.

Tentatively, course grades are determined from the total points (100) earned as follows:

90-100: A ; 75-89: B ; 60-74: C ; <60: F

However, students can expect the instructor to grade above the curve.

Make-ups:

No early quizzes or exams will be given. Failure to appear for a scheduled quiz or exam at the appointed time, unless due to a dire emergency will result in the assignment of a zero grade. Make-ups for (non-exam) graded activities may be arranged if your absence is caused by personal emergency. A written explanation (including supporting documentation) must be submitted to your Instructor. If the explanation is acceptable, an alternative to the graded activity will be arranged. Make-up arrangements must be arranged prior to the scheduled due date.

Notes:

- The Instructor reserves the right to modify course policies, the course calendar, and assignment or project point values and due dates.
- All students are expected to be responsible users of the computer systems used for this course.
- Students must be prepared to identify themselves with their UTA student ID cards during quizzes and exams.

Accepted file formats for papers/reports:

The Instructor is requiring the students to turn in their papers and reports either in *.pdf* (Adobe's portable document format – can be generated, e.g., either by *Adobe Distiller* or later versions of *ghostscript*) or in *.ps* (Adobe's Postscript – can be generated, e.g., from Latex source files by *latex* and *dvips* or from the Windows operating systems by installing a virtual postscript printer device and printing the document to a file) formats. Source files (!) must be turned in along with the paper in a zip or a gzip (or tgz, .tar.zip) archive. Students are encouraged to use the Latex language and its appropriate compilers or the Microsoft Office program family (please see the Instructor if you intend to use anything else). If viruses are submitted along with the files a student turns in, the Instructor may degrade the grade of the assignment.

Academic honesty:

All students are expected to pursue their academic careers with honesty and integrity. "Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts" (*Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22.*) Students found guilty of dishonesty in their academic pursuits are subject to penalties that may include suspension from the university. Any student found guilty of academic dishonesty will receive a -100% for that work (project, exam, homework, etc.) as well as having the course grade lowered one full letter grade - in addition to any other penalties assessed (suspension, expulsion, probation). These and other applying UTA rules, will be strictly enforced. Any case of academic dishonesty will be treated in accordance with the UTA *Handbook of Operating Procedures* or the Judicial Affairs website at <http://www2.uta.edu/discipline>. If you do not understand this policy, it is your responsibility to obtain clarification or any additional information you may require. Students are allowed to discuss homework with classmates, but are **not** allowed to copy the solutions of others or share solutions with others. All work turned in for grading must be the student's own work.

Students will be required to sign an academic honesty letter to be kept with the instructor. Failing to provide with such a letter by census day will result in the respective students' withdrawal from the class.

In addition to the punishment from the University, the instructor will give a "minus 100%" grade on the given assignment/exam in question.

Disabilities:

If you require any accommodation based on disability, please meet with the Instructor (with your supporting papers) in the privacy of his office the first week of the semester to be sure you are appropriately accommodated.

Grievance Procedure

Discussion or challenges of individual grades will not be entertained in the classroom before, during or immediately following class. Solutions/keys for quizzes and exams will be discussed in class, but will generally not be posted or made available for general distribution. In the case of dispute concerning submission/grade on an assignment, it is the student's responsibility to produce papers as proof. Exam papers will not be returned to the student. Anyone feeling that a dispute exists after the grading of any assignment or exam may submit a written grievance. This grievance should identify the item in dispute and arguments supporting the student's position. Grievances must be submitted in writing within two class periods following the return of the assignment. The instructor or GTA agrees to return a written response to the student's grievance within two class periods from receipt of the grievance. If the error is due to wrongful calculation of points, then no grievance needs to be submitted. If a written grievance is received, the instructor and GTA reserve the right to re-grade the entire exam (not just the specific point in question).

Schedule for CSE 5346/4346 - High Performance Networks
Spring 2008
(Mondays and Wednesdays, 4:00pm – 5:20pm, Classroom GACB 105)

Date	Day	Topics Covered/Comments	Text Sections	Project/ Presentation	Quiz/ Exam
1/14/2008	M	<i>Class Introduction</i>			
1/16/2008	W	Networking Fundamentals	Chapter 1		
1/23/2008	W	Introduction to NS2			
1/28/2008	M	Introduction to NS2			
1/30/2008	W	Protocols and the Internet (Review)	Chapter 2-3		
2/4/2008	M	High-Speed Networks: Frame Relay	Chapter 4		
2/6/2008	W	High-Speed Networks: ATM	Chapter 5		Q1
2/11/2008	M	High-Speed Networks: ATM, LANs	Chapter 5-6		
2/13/2008	W	Performance Modeling, Queuing Analysis	Chapter 7	Project 1	
2/18/2008	M	Queuing Analysis, Self-Similarity	Chapter 8-9		Q2
2/20/2008	W	Network Traffic Management Principles	Chapter 10		
2/25/2008	M	Error Control and ARQ Performance	Chapter 11		
2/27/2008	W	TCP Traffic Management and Congestion Control	Chap. 12, RFC 3168		
3/3/2008	M	TCP Congestion Control: TFRC, ABC	Papers, RFCs		Q3
3/5/2008	W	Traffic Management and ATM	Chapter 13a	Project 2	
3/10/2008	M	ATM Traffic and Congestion Control	Chapter 13b		
3/12/2008	W	Exam 1 (Chapters 1 – 13)			E1
3/17-3/21	M-F	Spring Break			
3/24/2008	M	Routing Principles, Multicast	Chaps. 14-16b		
3/26/2008	W	Quality of Service, IntServ	Chaps. 16b,17		
3/31/2008	M	DiffServ, QoS in the Internet	Chapter 17		
4/2/2008	W	Intserv and Diffserv	Chapter 17		
4/7/2008	M	QOS Protocols	Chapter 17	Project 3	
4/9/2008	W	QoS Protocols: RSVP and MPLS	Chapter 18		Q4
4/14/2008	M	QoS Protocols: RTP, etc.	Chapter 18		
4/16/2008	W	MPLS and Diffserv	Chapter 18		
4/21/2008	M	SIP, H.323	Chapter 18		
4/23/2008	W	Voice-over-IP	Papers, RFCs		Q5
4/28/2008	M	Review & Course Wrap-up		Project 4	
4/30/2008	W	Exam 2, Chapters 14 – 18			E2

Notes:

1. Assignment schedule may be adjusted during the semester.
2. Projects and other assignments **are due and will be collected at the beginning of the class period** indicated.
3. Quizzes will generally be allotted 15-20 minutes **at the end of the class period** indicated.