

Course **CSCI 7000-006**
TLEN 5440-001,7xx
Multimedia Networking
Spring 2006



Time Tuesdays 11:00 – 12:15 and 2:00 – 3:15
No classes March 28 and 30

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Location ECCS 1B28

Topic The course covers the co-evolution of traditional multimedia services (such as telephony and television) and traditional data services onto a common network infrastructure: representation and compression for speech, audio, images, and video; media transport using Real time Transport Protocol (RTP); quality of service. The course includes substantial material on social and business context.

Goals

- *Content:* develop a basic understanding of multimedia services and technology and the evolution of networking technology and protocols to support them. The focus is on multimedia services over an IP infrastructure.
- *Process:* active lecturing (lecturing interspersed with discussion and in-class problem working), diverse reading, laboratory, programming, and homework exercises.
- *Skills:* life skills in learning cutting edge technology (how to effectively aggregate book, academic journal, magazine, trade press, and web research), how to set technology learning in a economic, social, and business context.

Topical Outline	<ul style="list-style-type: none"> 1 context - the business of media transport, the big apps <ul style="list-style-type: none"> 1.1 telephony 1.2 entertainment and information 1.3 the web and beyond 1.4 networked media 2 media - representation, codecs <ul style="list-style-type: none"> 2.1 generics - digitization, compression primitives 2.2 audio 2.3 speech 2.4 images and graphics 2.5 video 3 media transport - RTP and its analogues <ul style="list-style-type: none"> 3.1 media transport using RTP 3.2 robustness 3.3 header compression, multiplexing, tunneling 3.4 security: encryption, NATs, firewalls, viruses, and spam 3.5 media transport alternatives 4 media friendly networking <ul style="list-style-type: none"> 4.1 QoS concepts, SLA 4.2 MPLS 4.3 Special networking – broadcast and multicast 4.4 Special networking – wireless
Prerequisites	Knowledge of basic networking protocols (IP family). CSCI 4273/5273 (Network Systems), TLEN 5330 (Data Communications 1), or consent of instructor.
Grading	<ul style="list-style-type: none"> 5% Worksheets 45% Assignments 20% Midterm 30% Final
Worksheets	Handed out during class and available with the lecture slides for distance ed students. The purpose is to convert an inefficient passive lecture into more efficient active learning. These count as “completed” if a decent attempt is made and they are turned in at the end of the lecture (on campus students) or submitted via WebCT within a week of the lecture date (distance ed students and absent on campus students).

Assignments There are four types of assignments.

Homeworks – these are problem sets that are submitted via WebCT, and count as one assignment each. There are 12 homeworks, each counts as a single assignment equivalent.

Laboratory Exercises – there are three laboratory exercises. These are performed in the ITP teaching laboratory. Each counts as 2 assignment equivalents.

Computer Programming Exercises – there are three programming exercises. These can be done on any suitable machine. Each counts as 2 assignment equivalents.

Paper – there is a short paper exercise. This counts as 3 assignment equivalents.

The Assignments Grade is calculated by:

- a) Grading everything submitted (am I a glutton, or what?).
- b) Sorting the assignments in descending order.
- c) Calculating the average grade over the top 12 assignment equivalents and dropping the rest. This is the Assignments Grade.

If you are an ITP on campus student, any laboratory exercise with a grade of “C” or below will automatically be included in “top 12 assignment equivalents.” (This means that failing to do a passing job on a laboratory has a strong penalty effect.)

If you are an ITP distance ed student, a paper with a grade of “C” or below will automatically be included in “top 12 assignment equivalents.”

If you are a CSCI student (on campus or distance ed), any programming exercise with a grade of “C” or below will automatically be included in “top 12 assignment equivalents.”

Late homework assignments are not accepted. Late programming exercises, lab exercises, and papers are penalized 5% for each 24 hour period they are late (as measured by WebCT timestamp), up to a maximum of one week, with the first 5% penalty exacted if they are late by more than 10 minutes. Don’t anticipate any exceptions to the late policy.

Online Course materials, homework assignments, homework submission, discussion, etc., will be online using WebCT (<http://www.colorado.edu/webct/>).

Midterm and Final The tests will be focused on mastery of the content of the course with a higher emphasis on relating and organizing the information than on memorizing specific details. Both midterm and final will be in class (or proctored).

Textbooks *Required:* Perkins, Colin. *RTP: Audio and Video for the Internet*, Addison-Wesley, 2003. (ISBN 0672322498)

Recommended: Collins, Daniel, *Carrier Grade Voice Over IP*, 2nd ed., McGraw Hill Professional, 2002. (ISBN 0071406344)

Recommended: Gibson, Jerry et al. *Digital Compression for Multimedia: Principles and Standards*. Morgan Kaufmann, 1998. (ISBN 1558603697)

Readings We will read frequently from the electronic libraries of the ACM and IEEE (available via Chinook <http://libraries.colorado.edu/>) and from trade press and other sources on the web. Readings will be posted on WebCT.

Disability If you qualify for accommodations because of a disability, please submit a letter to me from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, or

www.Colorado.EDU/disabilityservices

Disability Services' letters for students with disabilities indicate legally-mandated, reasonable accommodations. Other letters/requests you may receive from agencies such as the Wardenburg Student Health Center, or other health providers, such as physicians or counselors, are recommendations you may choose to follow to assist students but are not necessarily legal mandates. The syllabus statements and answers to Frequently Asked Questions can be found at

www.colorado.edu/disabilityservices

Religious Observances Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. See policy details at

http://www.colorado.edu/policies/fac_relig.html

Behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat students with understanding, dignity and respect, to guide classroom and online discussion and to set reasonable limits on the manner in which students express opinions.

See policies at

<http://www.colorado.edu/policies/classbehavior.html> and at
http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

Honor Code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Additional information on the Honor Code can be found at

<http://www.colorado.edu/policies/honor.html> and at
<http://www.colorado.edu/academics/honorcode/>