

CpE 319 – Digital Network Design
WS 2005 – Reference #: 50710

Section A **Class Hours:** T TR 9:30-10:45 **Class Room:** 101 ECE

Instructor: Dr. Joe Stanley
Office: 127 ECE
Office Hours: T TR 11:00-2:00; Other times by appointment
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Prerequisites: CpE 213 or computer hardware competence.

Course materials:

1. **Course text:** Tannenbaum A, *Computer Networks*, 4th Ed., Prentice Hall PTR, 1996.
2. **Course website:** All course handout materials and homework assignments will be maintained at the course web site blackboard.umn.edu.
3. **Software:** OPNET, a simulation tool that analyzes and predicts performance of computer networks. The tool will be used for the team project and is on all of the PC systems in 105 ECE.

Course/Laboratory Schedule: 3 hours lecture/week; no assigned laboratory schedule. Tool for homework and team project is available in PC lab with open seating; see separate handout.

Course Schedule:

Introduction	1.5 weeks
The Physical Layer	2.5 weeks
Paper Due	February 17
The Data Link Layer	2 weeks
Exam 1 (Ch 1-3)	March 3
The Medium Access Sublayer	3.5 weeks
The Network Layer	3 weeks
The Transport Layer	1 week
Exam 2 (Ch 4-6)	May 3
Projects Due	Noon, May 9

Reading Assignment (text):

Chapter 1
Chapter 2
Chapter 3
Chapter 4
Chapter 5
Chapter 6

Course Grading:

- Attendance on the exam dates is expected. Otherwise, attendance is not taken.
- Homework assignments are due by the start of class on the dates indicated in class. Since the lowest homework score will be dropped, LATE HOMEWORK PAPERS WILL NOT BE ACCEPTED. Homework assignments are selected problems from the text. Solutions to the homework problems will be posted on the course website after the due date as a reference.
- Exams will be open book and open notes. No additional materials will be allowed. On both exams and homework problems, work/derivation must be shown for partial credit to be awarded.
- Except for the team project, all work is on an individual basis.
- The team project constitutes the final exam for the course and is due on the Monday of the Final Exam week. LATE PROJECTS WILL NOT BE ACCEPTED.

Homework assignments (6 @ 30 points)	150 points	(lowest score dropped)
Paper	100 points	
Exams	250 points	
Team project	150 points	

Paper

Each student may select any topic covered in chapters 1-7.1 (including network security). Find two articles related to that topic in any of the following journals: IEEE SOFTWARE, IEEE COMPUTER and IEEE COMMUNICATIONS. NOTE: if you reference additional material, e.g. from the web, be sure to validate those sources. Technical writing style will constitute a portion of the paper grade; utilize library and university resources at your disposal such as the Writing Center. Use figures, tables, equations, etc., as appropriate, to make your report concise and clear. The paper should be a maximum of 5 pages (not including appendices) with one inch margins (top, bottom, left and right) and font size of 10 or greater. The paper outline is:

- Introduction

- Brief summary of each paper

- Comparison/contrast of the papers

- Conclusions

- Appendices: A copy of each article must be included as an appendix; paper and appendices will be returned.

Team Project

Background questionnaires from the first day of class will be used to assign the class into teams; team assignments will be announced by February 24, 2004, along with the project itself. The technical report, including all documentation, design, simulation results, and conclusions are due by NOON, Monday, May 9, 2004. In addition, each member will be asked to evaluate the relative contribution of each team member on his/her team. The project constitutes the final exam of the course and is equivalent to 1.5 exams. Technical writing style will be a portion of the project grade. The project report outline is:

- Introduction and Background Information

- Design Methodology: proven design approach, software tools used, timeline for tasks to accomplish, team member task assignments

- Results: verification and testing, design comparisons, performance analysis, merit and relative cost analysis, limitations of software tools

- Conclusions and Recommendations: design, performance, merit and cost, overall recommendation

- Appendices: details of description, design, results (simulation print-outs, etc.)