

CpE654ws / NIS654ws Design and Analysis of Network Systems

Spring 2007

Instructor: Prof. Victor Lawrence
Dept ECE
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Office hours: By appointment

Course description: This course covers the principles of network analysis, architecture, and design. These principles help in identifying and applying the services and performance levels that a network must satisfy. Principles of network analysis include network service characteristics, performance characteristics, network requirements analysis, and network flow analysis. Principles of network architecture and design include addressing and routing, network management architecture, performance architecture and design, security and privacy architecture, and quality of service design.

The course covers the principles and steps that you need to follow for planning the implementation of network systems. The course will be divided into two parts. The first part is for two weeks and covers the foundation of networking. If you took a computer network course before, then this part will be a review. In this part we will cover all background information in networking that is needed for the second part. In the second part, we will cover network analysis, architecture, and design topics.

Textbook:

- James D. McCabe, *Network Analysis, Architecture, and Design*, Second Edition, Morgan Kaufmann Publishers, San Francisco, CA, 2003. ISBN 1-55860-887-7. (Main textbook)

Other Suggested References:

- Andrew S. Tanenbaum, *Computer Networks*, Fourth Edition, Prentice Hall, Upper Saddle River, New Jersey, 2003, ISBN 0-13-066102-3. (We will use it for the first two weeks).
- Priscilla Oppenheimer, *Top-Down Network Design*, Second Edition, Cisco Press, 2004, ISBN: 1-58705-152-4.

Grading:

The grades in this class will be based on:

- Homework: 30% (3 homework assignments)
- Project: 30%
- Take home exam: 40%

Course Topic:

- Week 1: Basic Concepts in Networking
- Week 2: Example Networks and Network Components
- Week 3: Introduction to Network Analysis, Architecture, and Design
- Week 4: Network Requirements Analysis: Concepts
- Week 5: Network Requirements Analysis: Process
- Week 6: Flow Analysis
- Week 7: Network Architecture
- Week 8: Addressing and Routing Architecture
- Week 9: Network Management Architecture
- Week 10: Performance Architecture
- Week 11: Security and Privacy Architecture
- Week 12: Selecting Technology for the Network Design
- Week 13: Interconnecting Technologies with the Network Design