Computer Engineering 5410: Digital Network Design
Prior Number – Computer Engineering 319

Credit and Contact Hours
3 credit hours lecture (two 75 minute sessions per week), plus two laboratory assignments, each of which can be completed in one hour

Instructor
S. Sedighsarvestani, Ph.D.

Text(s)

Readings from current journals.

Professor-provided supplemental notes.

Catalog Information
Design of computer networks with emphasis on network architecture, protocols and standards, performance considerations, and network technologies. Topics include: LAN, MAN, WAN, congestion/flow/error control, routing, addressing, broadcasting, multicasting, switching, and internetworking. A modeling tool is used for network design and simulation.

Prerequisites
Computer Engineering 3150 (213) or computer hardware competency

Required or Elective
Required course

Course Goals
General Outcomes
1. Understand and practice the design of computer networks.
2. Describe an overview of communication networks, explaining the general principles governing the transport, network, medium access control, data link, and physical layers.
3. Describe how these layers operate and interact, and how the major functions of each layer are affected by network speed and user requirements.
4. Investigate the limitations of current networks such as the Internet, Ethernet, ATM, and wireless LANs.
5. Evaluate the performance of a network, and suggest improvements employing new technologies.
6. Use Adtran devices to configure and test simple networks.
### Relationship of Course to Program Outcomes

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S – strong connection; M – medium connection; W – weak connection

### Topics Covered
1. Introduction (1 week)
2. Physical Layer (3 weeks)
3. Data Link Layer (2 weeks)
4. Medium Access Control Sublayer (3.5 weeks)
5. Network Layer (2.5 weeks)
6. Internet Addressing and Transport Protocols (1.5 weeks)