CSC 435 – COMPUTER NETWORKING

CREDIT HOURS: 3
PREREQUISITES: CSC 241; CSC 323 or 333 or 341 or 342.
GRADE REMINDER: Must have a grade of C or better in each prerequisite course.

CATALOG DESCRIPTION

Computer communication and networking. Network organization and operation. Network architecture including hardware, software, protocols, and analysis. Example and proposed systems including LANs, WANs, and the Internet. Network applications and interfaces, security and integrity issues.

PURPOSE OF COURSE

Acquire communication concepts and vocabulary; explore protocol organization, analysis and examples; develop simple distributed programs; review some of the social and economic aspects of networking.

EDUCATIONAL OBJECTIVES

The goal of this course is to have students develop computer communications and networking skills. Success will be evaluated through the completion of laboratory and project assignments, performance on homework problems, and analysis of exam responses. Specific skills include:

1. Demonstrate knowledge of models, standards, and protocols for communication.

2. Develop skills in problem solving involving information (voice/video/data) transfer.

3. Apply queuing systems techniques to network design and performance.

4. Analyze protocol design, analysis, and examples in a layered framework.

5. Analyze data integrity and network security.

6. Recognize communications concepts and vocabulary.

7. Develop simple distributed computing programs.

8. Generalize Internet networking and application development skills.

CONTENT

| Overview of Teleprocessing and Data Communications | 3 |
| Objectives, Principles, Models, Standards          |   |
| Transmission Fundamentals                         | 3 |
| Media, Services, Devices, Codes                   |   |
| Analog and Digital Signals                        |   |
| Modulation and Modems                             |   |
Data Communication ........................................................................................................................................5
  Transmission modes
  Interface Standards
  Multiplexing
  Contention Protocols

Data Security and Integrity ...............................................................................................................................7
  Overview and Standards
  Parity, CRC, Hamming Codes
  Encryption and Decryption, Private and Public Key
  Data Integrity, Authentication, Signatures
  Viruses, Worms, Hacking

Protocols ...........................................................................................................................................................8
  Overview and Simple Protocol
  Flow Control
  Sliding Window Protocols
  Protocol Correctness
  Example Data Link Protocols

Local Area Networks ........................................................................................................................................8
  Topologies
  IEEE Standards (802.3, 802.4, 802.5, 802.11)
  Interconnecting LANs, DNS

Wide Area Networks .........................................................................................................................................5
  Routing and Network Protocols
  Transport Protocols
  Example Protocols: ATM, Wireless

Network Applications .......................................................................................................................................3
  TCP/IP Applications
  BISDN/ATM

Exams (plus final) .............................................................................................................................................3

TOTAL 45

REFERENCES

Aboelela, E., Network Simulation Experiments Manual, 2nd. Ed., (for Peterson, L. and Davie, B.,

FitzGerald, J., and Dennis, A., Business Data Communications and Networking, 10th. Ed, Wiley,
2009.

