

## CSC 435 - TELEPROCESSING AND DATA COMMUNICATIONS

**CREDIT HOURS:** 3

**PREREQUISITES:** CSC 241, 343

**GRADE REMINDER:** Must have a grade of C or better in each prerequisite course.

### CATALOG DESCRIPTION

Functional evolution and role of data communications. Considerations in data communications. Applications in general. The design issues. System components and their interrelationships. Networks.

### PURPOSE OF COURSE

Acquire communication concepts and vocabulary; explore protocol design, analysis, and examples; develop simple distributed programs.

NOTE: Graduate students taking CSC 435 for graduate credit will be expected to complete additional requirements, including but not limited to special projects, class presentations, relevant research, and supplemental evaluation (i.e., additional questions, quizzes, tests). Graduate students are expected to perform at a higher level than undergraduates. Students should contact the course instructor early in the semester (i.e., before the end of the add/drop period) to determine the specific additional requirements.

### 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.

Upon successful completion of the course, students should be able to:

1. Demonstrate knowledge of models, standards, and protocols for communication.
2. Demonstrate skills in problem solving involving information (voice/video/data) transfer.
3. Apply queuing systems techniques to network design and analysis.
4. Describe protocol design, analysis and examples in a layered framework.
5. Analyze data integrity and network security.
6. Identify communications concepts and vocabulary.
7. Develop simple distributed computing programs.
8. Demonstrate Internet networking and application development skills.

### CONTENT

**Hours**

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 Compression	
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)	
Interconnecting LANs	
Novell NetWare	
Wide Area Networks . . . . .	5
Routing and Network Protocols	
Transport Protocols	
Example Protocols: Internet, ATM	
Network Applications . . . . .	3
TCP/IP Applications	
ISDN, BISDN/ATM	
Exams (plus final) . . . . .	3
	TOTAL 45

**REFERENCES**

FitzGerald, J., and D.A., Business Data Communications and Networking, 6<sup>th</sup> Ed., Wiley, 1999.

Peterson and Davie, Computer Networks: A Systems Approach, 3<sup>rd</sup> Ed., Morgan Kaufmann, 2003.

Stallings, W., Data and Computer Communications, 7<sup>th</sup> Ed., Prentice Hall, 2004.