

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: DATA COMMUNICATIONS

Course No.: CET222

Program: COMPUTER ENGINEERING

Semester: 4

Date: JANUARY, 1988

Author: TYCHO BLACK

New:      Revision: X

APPROVED: *L.P. Crockett* *8/10/12*  
Chairperson Date

CET222DATA COMMUNICATIONSPHILOSOPHY/GOALS:

This course addresses the needs of the computer engineering technician to be well versed in both the practical and theoretical aspects of Data Communications. Asynchronous and synchronous communications, interface standards, protocols, modems, telephone system fundamentals, local area networks and computer network concepts are studied with many areas reenforced with practical lab activities.

METHOD OF ASSESSMENT:

3 WRITTEN TESTS	75%
LAB REPORTS AND QUIZZES	25%

TEXTBOOK :

"DATA COMMUNICATIONS AND DISTRIBUTED NETWORKS"  
by UYLESS D. BLACK (RESTON, 2nd. Ed.)

COURSE DURATION: 6 HOURS PER WEEK FOR 1 SEMESTER (15 WEEKS)

GRADING SCHEME  
CET222

1. TESTS

Written tests will be conducted as deemed necessary; generally at the end of each block or 2 of work. They will be announced about one week in advance. Quizzes may be conducted without advance warning.

2. LAB REPORTS

Lab reports not completed by the assigned due-date will be penalized. All lab reports must be completed satisfactorily to complete the course.

3. LAB ATTENDANCE

A total of 14 lab "credits" are required to complete the course. A "lab credit" is granted for attendance and satisfactory performance in a regularly scheduled lab class (3 hours)

4. GRADING SCHEME

A+	90	-	100%	Outstanding achievement
A	80	-	89%	Above Average achievement
B	70	-	79%	Average Achievement
C	55	-	69%	Satisfactory Achievement
I	Incomplete: Course work not complete at Mid-term. Only used at mid-term.			
R	Repeat			
X	A temporary grade that is limited to instances where special circumstances have prevented the student from completing objectives by the end of the semester. An X grade must be authorized by the Chairman. It reverts to an R if not upgraded in an agreed-upon time, less than 120 days.			

4. UPGRADING OF INCOMPLETES

When a student's course work is incomplete or final grade is below 55%, there is the possibility of upgrading to a pass when the student's performance warrants it. Attendance and assignment completion will have a bearing on whether upgrading will be allowed. A failing grade on all tests will remove the option of any upgrading and an R grade will result. The highest grade on re-written tests or assignments will be 56%.

Where a student's overall performance has been consistently unsatisfactory, an R grade may be assigned without the option of make-up work.

CET222SPECIFIC OBJECTIVES: DATA COMMUNICATIONSBLOCK 1: INTRODUCTION TO DATA COMMUNICATIONS (CHAP. 1,2)

1. Data Communications Organizations in Canada and the US.
2. Data transmission concepts: bits per second, baud, modulation, bandwidth, analog and digital transmission.
3. The nature of asynchronous and synchronous transmission.
4. Codes.
5. Line characteristics: point-to-point and multidrop configurations; simplex, half-duplex and full-duplex lines; switched lines vs. private or leased lines.
6. The telephone network.

BLOCK 2 MAJOR COMPONENTS IN A DATA COMMUNICATIONS SYSTEM (CHAP. 3)

1. Transmission media including wire pairs, cables, microwave, coaxial cable, satellite systems and optical fibre.
2. Modulation techniques: Amplitude modulation, frequency modulation, phase modulation, multilevel modulation techniques such as QAM.
3. Modem types and Bell standards.
4. Interface standards: EIA RS-232-C (V.24/V.28), RS-449 (RS-422/ RS-423), 20 ma. current loop.
5. Packet switching.
6. The techniques of multiplexing, line sharing and data compression.

BLOCK 3 TRANSMISSION IMPAIRMENTS (CHAP. 5)

1. The types of transmission impairments in a data communications system.
2. Error control methods.
3. Diagnostic equipment.

#### BLOCK 4 DATA LINK PROTOCOLS (CHAP. 6)

1. Requirements of synchronous data link protocols.
2. DATA LINK CONTROLS: classified by message format, line control method, error-handling methods and flow control procedure.
3. Message formats.
4. Line control methods.
5. Error handling methods.
6. Flow control techniques.
7. Three examples of data link protocols:
  - a) Bisync or BSC: a half-duplex character-oriented IBM protocol. This will include a study of code sets and the use of control codes.
  - b) SDLC (Synchronous Data Link Control) IBM's full-duplex bit-oriented protocol.
  - c) DDCMP (Digital Data Communications Message Protocol) DEC's byte-count oriented protocol.

#### BLOCK 5 DIGITAL TRANSMISSION (CHAP. 7)

1. The nature of digital transmission pulse code modulation (PCM), and the T1 carrier system.
2. Common digital pulse codes.
3. Integrated Services Digital Networks.

#### BLOCK 6 LOCAL AREA NETWORKS:LANs (CHAP. 9)

1. The nature of Local Area Networks.
2. LAN Topologies.
3. Access control methods for LANs.
4. Broadband vs. Baseband modulation.
5. PBX vs. LAN solutions.
6. ETHERNET LAN.
7. IBM Token Ring LAN.
8. Other LAN products.

BLOCK 7 NETWORK ARCHITECTURES (CHAP. 8)

1. Layered Protocols in computer networks.
2. ISO Open System Interconnection Model for Computer Networks.
3. IBM's System Network Architecture: SNA.