



# COURSE OUTLINE

## Division of Business and Technology

### NET 239

## Fundamentals of Data Communications

### Approved Catalog Description

Introduction to the fundamental concepts needed to understand and use computer communications technology. topics include modems, serial data connections, communications software, terminal emulation, commercial information services, electronic mail, and networks. Lab activities include using microcomputers, modems, communications software, commercial services, bulletin boards for commercial services, and electronic mail.

Text: Reference Division Booklist

Prerequisites: None

Credits: 3

Class Hours: 2

Lab Hours: 2

**Food and Drink are Strictly Prohibited in Classrooms as per Health and Safety Laws. Students may not bring in chemicals of any kind without the Appropriate MSD sheets.**

Course Coordinator: J. Weichert

Latest Review: Spring 2005

**I. GENERAL OBJECTIVES**

To provide students with:

- Introduction to MS-DOS commands and the DOS editor.
- Experience in creating a bootable diskette, creation of menus and batch control files.
- A working knowledge of the basic hardware and software elements required in Data Communications.
- An understanding of modems and modem standards.
- Experience in establishing communications from a PC to an online service and the Internet.
- Experience the use of various communications software and file transfer protocols.
- An understanding of the current communications industry and the various services provided by them.
- An understanding of the current trends in communications.

**II. LABORATORY**

There will be a minimum of 14 printed laboratory projects to be provided by the instructor. Many of the projects may have multiple parts. Each project will contain a specified point value, the grading criteria, and objectives.

**III. LABORATORY EVALUATION**

Each student's performance of a laboratory projects will be evaluated by the Instructor.

**IV. FINAL GRADE EVALUATION**

Unit Tests	50%
Laboratory Projects	35%
Quizzes and Homework	15%

**UNIT I**

**TOPIC:** Number systems, ASCII, MS-DOS, WINDOWS, MS-DOS commands, directory structures, formatting and labeling diskettes, copying files, and copying diskettes.

**READINGS:** Gillay & Peat - Chapters 1 through 6, and use of Appendices & Index.

**LABORATORY:** Several laboratory projects will be specified by the instructor to reinforce the lecture.

**OBJECTIVES:** Students will be able to:

1. Explain the term Academic integrity@, how it applies to this course, and state the possible penalties for violation of academic integrity in this course.
2. Demonstrate an understanding of the general rules and expectations regarding student behavior in the laboratory room.
3. Demonstrate an understanding of the decimal, binary, and hexadecimal number systems, including the ability to convert from any given one to the other.
4. Demonstrate the ability to use a chart of ASCII codes.
6. Given any of the following commands, including optional (as specified by instructor) or required parameters, state the result.

CD	MD
COPY	PATH
DATE	PROMPT
DEL	RD
DIR	RENAME
EDIT/NOTEPAD	TIME
EXIT	TYPE
FORMAT	VER
LABEL	VOL
	XCOPY

7. Define, or recognize the definition or function of the following:

application software	default directory	file specification	low-level formatting	Physical formatting
ALT PRINT SCREEN key	delimiter	folder	MB	PRINT SCREEN key
ASCII	destination file	formatting	mandatory parameter	Prompt
backing up	device names	Gig	meg	Redirection
bad sectors	directional key	Gigabyte	megabyte	Required parameter
binary number system	directory	GUI	MS-DOS	Root directory
bit	directory tree	high level formatting	non-bootable disk	Software
byte	ESC key	graphical user interface	noncontiguous	Source file
command syntax	external command	hard copy	OS	Subdirectory
cluster	FAT	hexadecimal	operating system	Syntax
command interpreter	file allocation table	internal command	optional parameter	System software
command processor	file extension	KB	overwrite	Variable parameter
default	file folder	Kilobyte	Parameter	Wild cards
default drive	file name	logical	Path	

8. State, write, or demonstrate the correct procedure to:
  - Insert or remove the cartridge drive.
  - Power On the microcomputer system.
  - Power Off the microcomputer system.
  - Access MS-DOS.
  - Obtain a hard copy of the screen while in MS-DOS.
  - Obtain the version of WINDOWS being used while in MS-DOS.
  - Minimize, maximize, or close the MS-DOS window.
  - Change the date and time while in MS-DOS.
  - Redirect the output of the DIR command.
  - Determine the current search path.
  - Create a directory.
  - Create a directory tree according to specifications.
  - Remove a specified directory.
  
9. State, or write, the reason this class will not:
  - Change the current search path.
  - Format the hard drive.
  
10. Given a specific problem print the needed DOS commands.
11. Identify and/or explain the terms: delimiter, parameter, and variable.
12. Create, navigate, change, and display a directory tree.
13. Demonstrate the ability to create, copy, move, and delete files within a directory tree.
14. Given a COPY command state/write the result.
15. Explain the importance/functionality of directory trees.

**TEST:** Unit Test after students have had the last laboratory project for this unit.

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## UNIT II

**TOPIC:** MS-DOS commands, file attributes, menus, batch files.

**READINGS:** Gillay & Peat - Chapters 7, 8, 10, 11, and use of Appendices & Index.

**LABORATORY:** At least three laboratory projects will be specified by the instructor to reinforce the lecture.

**OBJECTIVES:** Students will be able to:

1. Given a display of a file attributes, state/write an explanation of same.
2. State/write the effect upon a file's attributes when copying the file.
3. Given a specified problem or objective, state/write or demonstrate the use of the needed command or commands.
4. Demonstrate the use of the MS-DOS EDIT program to create a brief file.
5. Contrast the CHKDSK program with the Scan program.
6. Given any of the following commands, including optional [only those specified by the instructor] or required parameters, state the result.

ATTRIB	IF
CALL	PAUSE
CHOICE	PROMPT
CHKDSK	REM
DEBUG	RENAME
ECHO	SET
EDIT	XCOPY
EXIT	
GOTO	

7. Define, or recognize the definition or function of the following:

archive attribute	label (line label)
batch file	loop
conditional processing	memory resident
contiguous files	null value
CTRL-C keys	overstrike mode
CTRL-BREAK keys	positional parameter
cross-linked files	read-only attribute
debugging the batch file	read-only file
dummy parameter	replaceable parameter
file attribute	substitute parameter
hidden file	system attribute
insert mode	system file
	variable parameter

8. State/write any cautions that one must be aware of when running the CHKDSK program.
9. State/write the general information that is reported by the CHKDSK program.
10. State/write or demonstrate the procedure to DEFRAG your diskette.
11. State/write or demonstrate the procedure to run the CHKDSK program using your diskette.
12. State/write the search sequence followed by MS-DOS when you key a word at the MS-DOS prompt.
13. Write a simple batch file.
14. Write a batch file with multiple replaceable parameters.
15. Write a batch file that calls another batch file.
16. Write a batch file employing the IF ERRORLEVEL.
17. Write a batch file employing at least three choices.
18. Given a listing of a batch file state what it will accomplish.
19. Create, navigate, change, and display a directory tree.
20. Demonstrate an understanding and use of search paths.
21. Demonstrate the ability to create, copy, move, and delete files within a directory tree.
22. Given a file's attribute explain the attribute's function.
23. Demonstrate the ability to change the attribute of a given file.
24. Demonstrate an understanding of why knowledge and understanding of MS-DOS and its commands are necessary skills for a computer support person.

**TEST:** Unit Test after students have completed the last Windows command line laboratory project.

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**UNIT III**

**TOPIC:** Introduction to Data Communications; Asynchronous Modems, PC Communications Software.

**READINGS:** Held: Chapters 1, 2, 3, 4, and 9.

**LABORATORY:** Several projects will be assigned by the instructor to reinforce and introduce communications topics.

**OBJECTIVES:** The student will be able to:

1. Define, or recognize the definition or function of the following terms:

- |                       |                           |
|-----------------------|---------------------------|
| Data Communications   | DTE-DCE Interface         |
| Binary System         | Data Transmission Channel |
| Positional Notation   | UART                      |
| Communication Channel | Shielded Twisted Pair     |
| Signaling Elements    | Unshielded Twisted Pair   |
| EBCDIC                | Bounded Medium            |
| ASCII                 | Unbounded Medium          |
| LAN                   | Transponders              |
| Gateways              | Modem                     |
| Routers               | Amplitude Modulation      |
| DTE                   | Frequency Modulation      |
| DCE                   |                           |

2. Demonstrate an understanding of:

- Rules and student's responsibilities regarding userid and password for remote access.
- Correct handling of modems, power supplies, and cables.
- The historical foundations of Data Communications.
- The evolving technology in modems.
- The basic hardware and software components of a Personal Computer or an intelligent terminal.
- The typical data communication applications from a Personal Computer stand point.
- Business concepts related to data communications.
- Parallel and serial data transfer.
- Critical nature of clock rates in data transmission.
- Framing of asynchronous data.
- Satellite communication systems including LEOS.
- Cellular communication systems.

3. Compare asynchronous with synchronous data communications.

4. Compare analog with digital signals.

5. State the procedure to properly connect, initialize and test an external modem.

**TEST:** Unit Test after students have experienced the last laboratory project for this unit.

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**UNIT IV**

**TOPIC:** Asynchronous Modems, PC Communications Software,

**READINGS:** Held: Chapters 4, and 9.

**LABORATORY:** Several projects will be assigned by the instructor to reinforce and introduce communications topics.

**OBJECTIVES:** The student will be able to:

1. Define, or recognize the definition or function of the following terms:

- |                     |                        |
|---------------------|------------------------|
| GND                 | DCT                    |
| Ground              | DTR                    |
| Transmitted Data    | Data Terminal Ready    |
| TD                  | Ring Indicator         |
| RD                  | RI                     |
| Received Data       | Flow Control           |
| Request To Send     | Half-Duplex Modem      |
| RTS                 | Full-Duplex Modem      |
| CTS                 | Hayes-Compatible Modem |
| Clear To Send       | Analog Loopback Test   |
| DSR                 | Digital Loopback Test  |
| Data Set Ready      | Buffering              |
| SG                  | USB                    |
| Signal Ground       | Firewire               |
| Data Carrier Detect |                        |

2. Demonstrate an understanding of:  
Data compression.  
Error detection and correction.  
Flow Control for data communications.  
The need to specify to the communication software the exact manufacturer/model number of the modem being used.

3. State the minimum RS-232 interface required for communications.

4. Discuss the common functions, operating features, and limitations of RS-232.

5. State the signals employed by an Auto-Answer Modem. Describe the sequence of events when such a modem receives a ring on the telephone line.

6. Demonstrate the ability to initiate local loop-back tests.

7. Demonstrate the ability to display and/or change the contents of a specified modem register.

**TEST:** Unit Test after students have had the last laboratory project for this unit.

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