SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: COMPUTER SYSTEMS MAINTENANCE

Code No.: CET-209   Semester: 1

Program: Computer Engineering

Author: Frank Turco, Fred Carella, Mark Allemang

Date: JAN,1996   Previous Outline Dated: JAN, 1995

L.P. Chiquitti   *Jan 8, 1995.*

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APPROVED:

Dean   Date

TOTAL CREDITS: **4**

PREREQUISITES: **None**

I.   PHILOSOPHY/GOALS:

The objective of this practical lab-oriented course is to develop skills in troubleshooting, configuring and maintaining a variety of computer systems and peripherals, primarily in the DOS and PC based environment.

The emphasis will be on practical hands on skills rather than the underlying theory of operation, which is covered in other courses.

Both hardware and software problems will be demonstrated with practical exercises and troubleshooting tests scheduled to support the theory.

II.   STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

Upon successful completion of this course the student will be able to:

1. Use and manage a DOS computing environment effectively.

2. Apply a logical approach to troubleshooting PC's which will enable board level maintenance and installation, fault diagnosis and system integration.

3. Install and manage hard drive systems effectively.

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4.   Use test equipment and diagnostic software to troubleshoot
      computer systems.

5.   Maintain and configure PC system peripherals such as printers,
      serial ports, keyboards, mice and monitors.

6.   Be familiar with the various families of PC's and their buses
      and support chips.

III.   TOPICS TO BE COVERED:

1.   The history of the DOS operating system and its commands.

2.   A logical approach to board level troubleshooting.

3.   Diagnostic software and test equipment.

4.   Installation of hard drives, their interfaces and backup
      procedures.

5.   Resource conflicts and their resolution and system integration
      issues.

6.   Keyboard types and their maintenance.

7.   Printers and serial port characteristics, cables and
      troubleshooting.

8.   Memory management issues including the different classes of
      memory and memory types.

9.   The evolution of the PC architecture, their configurations,
      support chips and boards.

10.   Viruses and their control.

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IV.   LEARNING ACTIVITIES:

BLOCK I -   The DOS Environment

Upon successful completion of this block the student will be able to:

1.   Discuss the history of DOS and its limitations.

2.   Identify and use DOS commands useful for system maintenance.

3.   Identify and discuss the roles of DOS and BIOS within the PC architecture.

BLOCK II - PC Configurations

Upon successful completion of this block the student will be able to:

1. Identify the IBM XT and AT family of computers and their subsystems including motherboards, peripheral adapters, memory, expansion slots, CPU, power supply and keyboard.

2. Install and configure IBM PC, XT and AT systems. This includes understanding hardware and software configuration issues such as base addresses, interrupt and DMA settings as well as the CMOS setup.

3. Assemble and disassemble PC XT and AT systems.

4. Install and upgrade DOS.

5. Install and configure the Windows operating system as well as various software packages and be able to discuss the effects on system files

BLOCK III - Troubleshooting and Preventive Maintenance

Upon successful completion of this block the student will be able to:

1. Understand preventive maintenance issues and implement preventive maintenance techniques.

2. Apply a logical approach to troubleshooting PC systems at the board level.

3. Identify and correct resource conflicts.

BLOCK IV - Floppy and Hard Disk Drives

Upon successful completion of this block the student will be able to:

1. Install and maintain various floppy disk drive types and be able to discuss their mechanics, parameters, and future trends.

2. Install and maintain various hard disk types and interfaces including MFM, RLL, ST506/412, IDE, enhanced IDE and SCSI.

3. Perform low level formatting and be able to discuss disk drive parameters relating to performance and drive geometry.

4. Perform disk backups and be able to discuss the merits of different backup techniques and tools.

BLOCK V - Peripheral Maintenance

Upon successful completion of this block the student will be able to:

1. Perform serial and parallel cable maintenance.

2. Identify and install various peripheral adapters.

3. Identify and correct common monitor problems.

4. Utilize test equipment in the troubleshooting of peripheral interfacing problems.

5. Identify and correct keyboard failures.

6. Identify, maintain and discuss the merits of various printer technologies.

BLOCK VI - Related Troubleshooting Issues

Upon successful completion of this block the student will be able to:

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1. Discuss, identify and correct viruses.

2. Discuss, prepare for and integrate new peripheral subsystems.

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V. *METHOD OF EVALUATION*

3 THEORY TESTS (15% each)	45%
LAB PROJECTS/ASSIGNMENTS	40%
QUIZZES AND PRACTICAL TESTS	10%
ATTENDANCE	5%

(The percentages shown above may have to be adjusted to accurately evaluate student skills. Students will be notified of any changes made.)

GRADING SCHEME

A+	90	-	100%
A	80	-	89%
B	70	-	79%
C	55	-	69%
I	Incomplete		
R	Repeat		

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 a student meets the following criteria:

1. The students attendance has been satisfactory.
2. The student has not failed all of the theory tests.
3. The student has made reasonable efforts to participate in class and complete assignments.

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LABS:

Lab activities represent a very important component of this course in which practical 'hands-on' skills will be developed. Because of this, attendance is mandatory and the satisfactory completion of all lab activities is required. Evaluation of lab work in-class will be done. It is the student's responsibility to discuss absences from regularly scheduled labs with the instructor so that alternate arrangements (where possible) can be made to complete the lab requirements.

ATTENDANCE:

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor, so that remedial activities can be scheduled. Absenteeism for tests can only be allowed for medical reasons and should be authorized ahead of time. Unauthorized absences could result in a zero grade being assigned.

VI.   PRIOR LEARNING ASSESMENT

Students who wish to apply for advanced credit in the course should consult the instructor.

VII.   REQUIRED STUDENT RESOURCES

1)   Text Book:
        "PC Upgrading and Repair" by Scott Mueller (QUE BOOKS)

2)   Course Handout notes.

VIII.   ADDITIONAL RESOURCE MATERIALS

Will be identified as required.

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IX.   *SPECIAL NOTES:*

1. Students with special needs (eg. physical limitations, visual or hearing impairments, or learning disabilities) are encouraged to discuss any required accommodations confidentially with the instructor.

2. Your instructor reserves the right to modify the course as deemed necessary to meet the needs of students or take advantage of new or different learning opportunities.