

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE OUTLINE: COMPUTER SYSTEM MAINTENANCE

CODE NO.: ELN 230-5

PROGRAM: ELECTRICAL / ELECTRONIC TECHNICIAN

SEMESTER: THREE

DATE: SEPTEMBER 1995

**PREVIOUS
OUTLINE DATED:** NONE

AUTHOR: ENO LUDAVICIUS

NEW: X REV.:

APPROVED: Bill Armstrong
COORDINATOR

Nov. 14, 1995
DATE

R. A. August
DEAN

95-11-14
DATE

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TOTAL CREDIT HOURS: 60

PREREQUISITE(S): CET 100

PHILOSOPHY/GOALS:

THE OBJECTIVE OF THIS PRACTICAL LAB-ORIENTED COURSE IS TO DEVELOP SKILLS IN THE TROUBLESHOOTING, CONFIGURING AND MAINTAINING A VARIETY OF COMPUTER SYSTEMS AND PERIPHERALS, IN DOS AND WINDOWS ENVIRONMENT. THE EMPHASIS WILL BE ON PRACTICAL HANDS-ON SKILLS RATHER THAN THE UNDERLYING THEORY OF OPERATION. BOTH HARDWARE AND SOFTWARE PROBLEMS WILL BE DEMONSTRATED WITH PRACTICAL EXERCISES.

STUDENT PERFORMANCE OBJECTIVES:

UPON SUCCESSFUL COMPLETION OF THIS COURSE, THE STUDENT WILL BE ABLE TO:

1. TROUBLESHOOT A PC IN A LOGICAL APPROACH FOR BOARD-LEVEL MAINTENANCE AND INSTALLATION, FAULT DIAGNOSIS AND SYSTEM INTEGRATION.
2. INSTALL AND MANAGE PC HARDWARE SYSTEM COMPONENTS EFFECTIVELY.
3. UTILIZE TEST EQUIPMENT AND DIAGNOSTIC SOFTWARE TO TROUBLESHOOT PC SYSTEMS.
4. RECOGNIZE THE VARIOUS FAMILIES OF PC'S ARCHITECTURE.
5. BUILD, COMMISSION AND OPERATE A BASIC PC SYSTEM.

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TOPICS TO BE COVERED:

1. PERSONAL COMPUTER BACKGROUND
2. OVERVIEW OF SYSTEM FEATURES AND COMPONENTS
3. SYSTEM TEARDOWN AND INSPECTION
4. MOTHERBOARDS
5. BUS SLOTS AND I/O CARDS
6. MICROPROCESSOR TYPES AND SPECIFICATIONS
7. MEMORY
8. THE POWER SUPPLY
9. VIDEO DISPLAY HARDWARE AND SPECIFICATIONS
10. FLOPPY DISK DRIVES AND CONTROLLERS
11. HARD DISK DRIVES AND CONTROLLERS
12. MAINTAINING YOUR SYSTEM
13. SOFTWARE AND HARDWARE DIAGNOSTIC TOOLS
14. OPERATING SYSTEMS SOFTWARE AND TROUBLESHOOTING
15. SYSTEM UPGRADES AND IMPROVEMENTS

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LEARNING ACTIVITIES

REQUIRED RESOURCES

TEXT: UPGRADING AND REPAIRING PCs

1. PERSONAL COMPUTER BACKGROUND
 - PC HISTORY
 - INTEL MICROPROCESSOR FAMILY
 - THE ULTIMATE MULTIMEDIA PENTIUM SYSTEM
2. OVERVIEW OF SYSTEM FEATURES AND COMPONENTS
 - TYPES OF SYSTEMS
 - HARDWARE AND SOFTWARE ARCHITECTURE
 - DOCUMENTATION
3. SYSTEM TEARDOWN AND INSPECTION
 - USING PROPER TOOLS & TEST EQUIPMENT
 - DISASSEMBLY PROCEDURES
4. MOTHERBOARDS
 - ARCHITECTURES
 - REPLACEMENT MOTHERBOARDS
 - OBSERVE AND IDENTIFY SYSTEM COMPONENTS
5. BUS SLOTS AND I/O CARDS
 - IDENTIFY BUS TYPES
 - TYPES OF I/O BUSES
 - SYSTEM RESOURCES
 - PLUG-AND-PLAY SYSTEMS
6. MICROPROCESSOR TYPES AND SPECIFICATIONS
 - PROCESSOR SPECIFICATIONS
 - INTEL PROCESSORS
 - MATH COPROCESSORS
 - PROCESSOR TESTS

LEARNING ACTIVITIES

REQUIRED RESOURCES

TEXT: UPGRADING AND REPAIRING PCs

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| 7. MEMORY | |
| - THE SYSTEM LOGICAL MEMORY LAYOUT | |
| - PHYSICAL MEMORY | |
| - TESTING MEMORY | |
| 8. THE POWER SUPPLY | |
| - FUNCTIONALITY & OPERATION | |
| - TROUBLESHOOTING | |
| - REPAIRING | |
| 9. VIDEO DISPLAY HARDWARE AND SPECIFICATIONS | |
| - MONITORS | |
| - VIDEO CARDS | |
| - ADAPTER AND DISPLAY TROUBLESHOOTING | |
| 10. FLOPPY DISK DRIVES AND CONTROLLERS | |
| - DRIVE COMPONENTS | |
| - TYPES OF FLOPPY DRIVES | |
| - DRIVE INSTALLATION PROCEDURES | |
| - TROUBLESHOOTING AND CORRECTING PROBLEMS | |
| 11. HARD DISK DRIVES AND CONTROLLERS | |
| - IDENTIFY HDD MEDIA | |
| - HDD OPERATION | |
| - HDD INTERFACES | |
| - HDD INSTALLATION PROCEDURES | |
| - HDD TROUBLESHOOTING | |
| 12. MAINTAINING YOUR SYSTEM | |
| - PREVENTIVE MAINTENANCE PROGRAM | |
| - USING POWER PROTECTION SYSTEMS | |
| - USING DATA BACKUP HARDWARE | |

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LEARNING ACTIVITIES

REQUIRED RESOURCES

TEXT: UPGRADING AND REPAIRING PCs

- 13. SOFTWARE AND HARDWARE
DIAGNOSTIC TOOLS
 - POWER-ON SELF TEST
 - DIAGNOSTIC PROGRAMS
 - DISK DIAGNOSTICS
 - DATA RECOVERY UTILITIES
 - CONFIGURATION UTILITIES
 - WINDOWS DIAGNOSTIC SOFTWARE

- 14. OPERATING SYSTEMS SOFTWARE
AND TROUBLESHOOTING
 - DISK OPERATING SYSTEM (DOS)
 - BASIC DOS COMMAND STRUCTURE
 - BOOTING DOS
 - BACKING UP DOS
 - DOS FILES
 - THE DEBUG PROGRAM

- 15. SYSTEM UPGRADES AND IMPROVEMENTS |
 - UPGRADING MEMORY |
 - UPGRADING ROM BIOS |
 - UPGRADING DISK DRIVES |
 - SPEEDING UP A SYSTEM |
 - UPGRADING THE OPERATING |
 - SYSTEM |

METHOD(S) OF EVALUATION

TESTS - TWO WRITTEN TESTS WORTH 50% TOTAL AND A MINIMUM OF 55% ON ALL TWO TESTS COMBINED MUST BE OBTAINED TO ACHIEVE A PASSING GRADE.
(OPTION OF 50% TOTAL FOR FINAL TEST IS RESERVED BY TEACHER AND CLASS)

PROJECTS - ONE MAJOR LAB PROJECT IS WORTH 20%.
- THREE-FIVE MINOR LAB PROJECTS ARE WORTH 20%.
LAB TESTS - ONE PRACTICAL TEST IS WORTH 10%.

TOTAL 100%

THE GRADING SYSTEM USED WILL BE AS FOLLOWS:

A+ = 90 - 100% A = 80 - 89% B = 70 - 79% C = 55 - 64%

R REPEAT

REQUIRED STUDENT RESOURCES:

TEXT BOOK : 1) UPGRADING AND REPAIRING PCs
BY: MUELLER (4th EDITION)

ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE
AUTOMATION LIBRARY IN B104

SPECIAL NOTES: