SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: Computer Hardware-II

Code No.: CST1010 Semester: 2

Program: **Computer Engineering Technology,**
Computer Network Technology,
Computer System Support Technology,
Computer Programming.

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Date: January, 2003 Previous Outline Date: January, 2002

Approved: _____ _____
Dean Date

Total Credits: 4 Prerequisite(s): None
Length of Course: 4 hours/week Total Credit Hours: 64

I. COURSE DESCRIPTION:

This course introduces the student to PC hardware components, concepts, maintenance, basic troubleshooting, DOS and Windows 98 from an installation/maintenance point of view. The areas of study include microprocessors, memory organization, busses and common computer subsystems, storage and other peripherals. The theory is reinforced and practical skills are developed with hands on lab exercises, which include assembly, disassembly, basic configuration and troubleshooting of PC systems, installation of DOS and Windows 98. This course is one of a number of courses that prepare the students for A+ certification.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

A. Disassemble and Assemble a PC.

Potential Elements of the Performance:

1. Identify and describe the role of all system components.
2. Identify and describe the difference between the different system types (AT, XT...).
3. Use various tools and procedures in the process of assembling and disassembling PC systems.
4. Discuss the application of various chemicals in the cleaning and assembling PC systems.
5. Apply safe handling methods in the assembly and disassembly of PC's and peripheral components.
6. Discuss the dangers of static electricity and to apply precautions against it.
7. Identify high voltage areas and practice safe handling in those areas.
8. Discuss and apply pre-disassembly precautions such as carefully documenting the system state and gathering all relevant documentation and sources of that documentation.

B. Identify and Describe Computer Subsystems.

Potential Elements of the Performance:

1. Discuss the "input/process/output" model of a computer system as it relates to the PC.
2. Identify and discuss the merits of the various microprocessors available for PC systems.
3. Identify and discuss the role of various computer busses such as AGP, VESA, PCI, 8-bit and 16 bit ISA, EISA, MCA, etc....
4. Identify the various memories available including RIMMs, DIMMs, SIMMs, SIPPs, EDO, SD and to discuss the differences between them.
5. Discuss the role of the memory subsystem and to distinguish between memory types such as conventional, extended, expanded, HIMEM, UMA , BIOS, video RAM and cache RAM.
6. Discuss the memory map and its evolution and to relate the map to the I/O subsystem, BIOS, cache and virtual memory.

C. Install, Configure and Contrast Computer Storage (Floppy/Hard Drives).

Potential Elements of the Performance:

1. Identify and install floppy disk drive.
2. Identify and install hard disk drive.
3. Discuss the process of installing CD-ROMS and the drivers.
4. Identify the various peripheral interface cables for IDE, E-IDE, SCSI, USB, serial, parallel.

D. Identify and Describe Computer Peripherals (input/output).

Potential Elements of the Performance:

1. Discuss the process of installing new I/O peripherals including sound cards and their drivers.
2. Identify configuration issues and apply the setting of the IRQ, DMA and Base Addresses in the resolution of device conflicts.
3. Identify the various peripheral port connectors.
4. Identify and discuss the various video subsystems available for the PC.
5. Identify and discuss the merits of various printer technologies.

E. Install Operating System.

Potential Elements of the Performance:

1. Install a DOS operating system and understand the difference between a full install, an upgrade and apply preinstall procedures such as backups.
2. Understand and be able to discuss the following operating system structures and how they are created and to apply that understanding in the lab environment:
   The Boot Process,
   FAT,
   Master Partition Boot Sector,
   Directories,
   DOS Volume Boot Sector
   Partitions
   System files required for boot
3. Use and apply the following DOS commands and facilities within the context of maintenance and installation procedures:
   FDISK
   SCANDISK
   MSD
   MODE
   DOUBLESPACE/DRIVESPACE
   MEMMAKER
   FORMAT/S
   COPY CON
   INTERLNK
   BACKUP

AUTOEXEC.BAT file -->
- LH
- SET
- PATH
- APPEND
- DEVICE DRIVERS

CONFIG.SYS file -->
- DEVICE DRIVERS
- DEVICEHIGH
- HIMEM, EMM386
- RAMDRIVE
- SMARTDRIVE

4. Install Windows 98 operating system in view of device management.

F. Troubleshoot and Maintenance of PC.

Potential Elements of the Performance:

1. Discuss and apply several diagnostic programs to the maintenance and troubleshooting of hard disk drives, motherboard and device conflicts.
2. Be aware of and to apply various anti virus software to the prevention and spread of viruses.
3. Describe the care and maintenance of laser printers and their components.

III. TOPICS:

1. How Computers Work - An Overview
2. Model of a computer system - input/process/output/memory/storage. Computer subsystems including the CPU, local and I/O busses, memory and peripherals.
3. PC assembly and disassembly.
4. Operating system (DOS, Windows 98) installation from a maintenance technician's point of view.
5. Software diagnostic tools, troubleshooting and maintenance

IV. REQUIRED TEXTS/RESOURCES/ MATERIALS:

1. Text Book:
   Upgrading and repairing PCs, 14th edition, by- Scott Mueller, QUE,
   ISBN: 0-7897-2745-5
2. Screwdrivers:
   - 1 small head Philips,
   - 1 medium head Philips
   - 1 small flat head screwdriver
3. Pliers:
   - 1 Nose pliers

4. 10 Floppy Diskettes

V. EVALUATION PROCESS/GRADING SYSTEM:

The mark for this course will be arrived at as follows:

3 Theory tests (20% each)	60%
Lab work, Quizzes and Assignments	40%
(The percentages shown above may have to be adjusted to accurately evaluate student skills. Students will be notified of any changes made.)	
Total	100%

Some minor modifications to the above percentages may be necessary. The professor reserves the right to adjust the mark up or down 5% based on attendance, participation, leadership, creativity and whether there is an improving trend.

80% attendance required in the labs and lectures.

- Students must complete and pass both the test and assignment portion of the course in order to pass the entire course.
- All Assignments must be completed satisfactorily to complete the course.
- Late hand in penalties will be 5% per day. Assignments will not be accepted past one week late unless there are extenuating and legitimate circumstances.
- Makeup Tests are at the discretion of the instructor and will be assigned a maximum grade of 60%.
- The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reasons thereof.
- A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.

  NOTE: If action is to be taken, it will range from marks being deducted to a maximum of removal from the course.

Grading Scheme:

The following semester grades will be assigned to students in post-secondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field placement or non-graded subject areas.
U	Unsatisfactory achievement in field placement or non-graded subject areas.
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see *Policies & Procedures Manual – Deferred Grades and Make-up*).
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.

Eligibility for X Grades/Upgrading of Incompletes

When a student's course work is incomplete or final grade is below 60%, there is the possibility of upgrading to a pass when a student meets all of the following criteria:

- The student's attendance has been satisfactory.
- An overall average of at least 50% has been achieved.
- The student has not had a failing grade in all of the theory tests taken.
- The student has made reasonable efforts to participate in class and complete assignments.

Note: **The opportunity for an X grade is usually reserved for those with extenuating circumstances.** The nature of the upgrading requirements will be determined by the instructor and may involve one or more of the following: completion of existing labs and assignments, completion of additional assignments, re-testing on individual parts of the course or a comprehensive test on the entire course.

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:

Attendance is mandatory. 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. SPECIAL NOTES:

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

Retention of course outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

Plagiarism:
Students should refer to the definition of "academic dishonesty" in *Student Rights and Responsibilities*. Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:
The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.