

COURSE OUTLINE

PC ASSEMBLY, MAINTENANCE & REPAIR

Course Title

GE 223

Dept & Course No.

I. COURSE DESCRIPTION

This course is design to provide the students with the knowledge and skills required in PC assembly, upgrading, repair, and maintenance. It includes software maintenance, providing backup files, system troubleshooting and repair, and basic concepts of local area networking.

II. SEMESTER CREDIT: 3 **III. CONTACT HOURS PER WEEK:** 2
Lecture 3
Lab 5
Total**IV. PREREQUISITE:** GE 113 and GE 115**V. STUDENT LEARNING OUTCOMES:**

Upon completion of the course, the students will be able to, with 65% accuracy to;

1. Identify the hardware that make up a basic PC
2. Test the power supply system
3. Explain the function of an extended keyboard
4. Install removable disk drives
5. Identify the architectural structure of the motherboard and its peripheral connections.

VI. COURSE CONTENT

- A. The parts of a basic PC
 - 1) Observe safety precautions in the use of computers and the computer lab
 - 2) Computer monitor
 - 3) Key board
 - 4) Mouse
 - 5) System unit
 - 6) Floppy disk drive
 - 7) CD ROM drive
 - 8) Front panel controls
- B. Regulated Power Supply
 - 1) Voltage Reference
 - 2) Discrete Component Regulators
 - 3) Integrated Circuit Linear Regulators
 - 4) Control of SMPS and Power Losses
 - 5) Transformer Isolated SMPS
 - 6) Direct Off-line SMPS
- C. Keyboard functions
 - 1) Letter Keys
 - 2) Punctuation Keys
 - 3) Spacebar
 - 4) Numeric Key Pad
 - 5) Arrow Keys
 - 6) Function Keys
 - 7) Additional Keys
- D. Disk drive functions
 - 1) Loading and
 - 2) Removing Floppy Disk
 - 3) Loading and removing CD ROM Disc
 - 4) Accessing hard disk drives
- E. The computer unit
 - 1) Mother Board
 - 2) Option Slots
 - 3) Daughter Boards

6. Explain the physical processes involved in dismantling a PC.
 - 4) Power Supply
 - 5) Floppy Disk Drives
 - 6) Hard Disk Drives
 - 7) Power Switch
 - 8) Turbo Indicator
 - 9) Reset Button
 - 10) BIOS
 - 11) CMOS Battery
 - 12) SIMM Sockets
 - 13) Cache Memory
7. Explain the processes and procedure used in assembling a PC
 - F. Dismantling a PC
 - 1) Installation of ESD System
 - 2) Basic Hand Tools for Servicing PCs
 - 3) Setting up the Work Station
 - 4) Schematic Diagrams and Connection Diagrams
 - 5) Screws and Fittings
 - 6) Cable Connectors
 - 7) Edge Connectors
 - 8) Dismantling Sequence
 - G. PC Assembly factors
 - 1) Determining the Sequence of the Assembly Procedure
 - 2) Hardware Assembly Procedure
 - 3) Checking of Screws for Correct Thread and Length
 - 4) Hand Tools for PC Assembly
 - 5) Daughter Board Edge Connectors
 - 6) Internal Wirings and Cable Connectors
8. Apply system test procedure for PC
 - H. Installation set-up and Diagnostic software
 - 1) Running the Set Up Disk
 - 2) Running the Diagnostic Software
 - 3) Fault Identification and Correction
 - 4) System Configuration
 - 5) System Set Up Computer Files
9. Discuss POST process
 - I. Power-On Self Test System
 - 1) POST function on the CPU
 - 2) POST function of the system bus
 - 3) POST function on the peripheral interface cards
 - 4) POST function on the memory circuits
 - 5) POST function on the connected I/O devices
10. Configure PC using DOS commands
 - J. Disk operating system
 - 1) System Initialization
 - 2) Loading of System Files into RAM
 - 3) Internal DOS Commands
 - 4) External DOS Commands
 - 5) Configuration Files
 - 6) Automatically Executed Files
 - 7) Other computer files used in the operating system
11. Optimize computer memory usage.
 - K. Compressing and optimizing storage disk
 - 1) Drive Clusters and Drive Size
 - 2) Cluster Sizes on Compressed Disk
 - 3) Zipping Files

12. Install window application program.
 - 4) LZ Identification of Patterns
 - 5) Defragging
13. Troubleshoot and repair computer
 - L. Installation and application of windows program
 - 1) Identification of Hard ware Requirements
 - 2) Installation Procedures
 - 3) Soft Ware Serial Number Identification
 - 4) Windows Tutorial
 - 5) The Hard Ware Troubleshooter
 - M. Hardware removal and installation
 - 1) Floppy disk drives
 - 2) Hard disk drives
 - 3) Sound cards
 - 4) CD ROM drives
 - 5) SVGA cards
 - 6) MODEM
 - 7) Operating the new hardware detection program
 - 8) Power supply
 - 9) Running the system check and diagnostic software
 - N. PC troubleshooting procedures
 - 1) Simulation Fault Cards
 - 2) Utilization of Logic Probes
 - 3) Cleaning Disk Drive Heads
 - 4) Maintenance Procedures
 - 5) Running the Diagnostic Software to Detect Trouble
 - 6) Running the Windows Hardware Troubleshooter
 - 7) Fixing the Monitor
 - O. Local area network
 - 1) Requirements and Devices
 - 2) Network Topology
 - 3) Buss and Cables
 - P. LAN cabling procedures
 - 1) Types of connection
 - 2) 2. LAN setup and configurations
 - 3) 3. LAN test procedures
 - Q. Upgrading procedure/requirements
 - 1) Upgrading RAM
 - 2) Adding new HDD
 - 3) Upgrading add-on card
14. Discuss local area networking
15. Perform LAN cabling
16. Upgrade the computer

VII. MATERIALS AND EQUIPMENT

A. MATERIALS

1. Diagnostic software
2. Windows operating system software
3. Antivirus software
4. mother board for replacement part
5. Sound card for replacement part
6. Speaker
7. Memory card for replacement
10. PC Powers Supply for replacement part
11. CD/DVD ROM Drives for replacement part
12. PC cables
13. PS/2 and USB Keyboard for replacement part.
14. Electronic components replacement parts

- part
- 8. Video card for replacement part
- 9. Hard disk drive for replacement part

- 15. Headphones with Boom Microphones
- 16. Static Protection Wrist Strap
- 17. Set of PC

VIII. TEXT AND REFERENCES

- A. *Required Text*
NONE. Instructor's made handouts:

IX. METHOD OF INSTRUCTION

- A. Lecture for the presentation of theory.
- B. Demonstration for the presentation of skills.
- C. Computer Aided Learning
- D. Research/calculations
- E. Practical experiments for emphasis of known principles.

X. METHOD OF EVALUATION

- A. Knowledge will be evaluated using the following methods:
 - 1. Written test
 - 2. Graded recitation/Oral presentation
 - 3. Instructor's Interview

- B. Skills will be evaluated using the following criteria:
 - 1. Accuracy
 - 2. Quality of work
 - 3. Safety
 - 4. Timeliness/Completion

- C. Midterm and final grade are computed and weighted using the following criteria:

Participation	10%
Portfolio.....	10%
Quizzes/Homework	10%
Midterm/Final Examination	20%
Laboratory Performance/Project.....	<u>50%</u>
TOTAL = 100%	

- D. Transmutation of total percent to letter grade:

90-100%.....	A
80-89%.....	B
70-79%.....	C
65-69%.....	D
00-64%.....	F

TASK LISTING

GE 223 PC ASSEMBLY, MAINTENANCE & REPAIR

Credit:

2

3

48

Course No. & Title

Lec

Lab

Total Lab Hrs

COURSE LEARNING OUTCOMES	Allotted Hours
1. Assemble the system unit of computer and load the operating system 1.1 Open a computer and identify each part in general. 1.2 Identify specific major components in a PC. 1.3 Install operating software in PC 1.4 Install utilities and other diagnostic software in PC 1.5 Disassemble and reassemble a typical PC. 1.6 Use MS DOS command files, file management and directories. 1.7 Back-up and restore data on a hard drive.	12
2. Troubleshoot and repair computer 2.1 Troubleshoot PC 2.2 Perform testing procedures on computer power supplies. 2.3 Perform keyboarding cleaning. 2.4 Remove defective hardware of personal computer 2.5 Diagnose/Test computer hardware 2.6 Reinstall computer hardware and other computer peripheral devices. 2.7 Use diagnostic software to test and evaluate all circuit, ports and disk drives in a PC. 2.8 Troubleshoot and repair monitor 2.9 Connect LAN cables 2.10 Setup and configure PC for LAN detections 2.11 Troubleshoot LAN connection	20
3. Upgrade the computer 3.1 Upgrade storage capacity of PC 3.2 Upgrade graphic display of PC 3.3 Upgrade memory capacity of PC 3.4 Upgrade PC operating system 3.5 Upgrade antivirus and other software	16
	48

Palau Community College
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Course Learning Outcomes

During the course experience, the **course learning outcomes** (CLO) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical rating of 4,3,2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcome listed below.

Rating Scale:	5.	Excellent
	4.	Above average
	3.	Average
	2.	Below Average
	1.	Unacceptable

1. Assemble the system unit of computer and load the operating system

5	The student is able to assemble the system unit of computer and load the operating system without any supervision and instruction
4	The student is able to assemble the system unit of computer and load the operating system with limited supervision but no instruction
3	The student is able to assemble the system unit of computer and load the operating system with limited supervision and limited instruction
2	The student has difficulty to assemble the system unit of computer and load the operating system and requires considerable supervision and instruction
1	The student is unable to assemble the system unit of computer and load the operating system.

2. Troubleshoot and repair computer

5	The student is able to troubleshoot and repair computer without any supervision and instruction
4	The student is able to troubleshoot and repair computer with limited supervision but no instruction
3	The student is able to troubleshoot and repair computer with limited supervision and limited instruction
2	The student has difficulty to troubleshoot and repair computer and requires considerable supervision and instruction
1	The student is unable to troubleshoot and repair computer.

3. Upgrade the computer

5	The student is able to upgrade the computer without any supervision and instruction
4	The student is able to upgrade the computer with limited supervision but no instruction
3	The student is able to upgrade the computer with limited supervision and limited instruction
2	The student has difficulty to upgrade the computer and requires considerable supervision and instruction
1	The student is unable to upgrade the computer