



மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்

**MANONMANIAM SUNDARANAR UNIVERSITY**

**SYLLABUS FOR CERTIFICATE IN HARDWARE TECHNOLOGY  
PROGRAM OFFERED THROUGH DIRECTORATE OF VOCATIONAL EDUCATION  
(COMMUNITY COLLEGES AND VOCATIONAL SKILL DEVELOPMENT CENTRES)  
FROM 2019 - 2020**



கல்விசார் நிலைக்குழுக் கூட்டம்

**MEETING OF THE STANDING COMMITTEE ON  
ACADEMIC AFFAIRS HELD ON WEDNESDAY  
THE 22<sup>nd</sup> JANUARY 2020.**

## CERTIFICATE IN HARDWARE TECHNOLOGY

வன்பொருள் தொழில்நுட்பம் சான்றிதழ் படிப்பு

### SCHEME OF EXAMINATION

Subject Code	Title of the Course	Credit	Hours	Passing Minimum
C19WT11/E19WT01	Introduction to Computer Hardware	6	90	40/100
C19WT12/E19WT02	Computer Hardware Maintenance	6	90	40/100
C19WTP1/E19WTP1	Practical I – Basic Computer Hardware Lab	4	120	40/100
C19WTP2/E19WTP2	Practical II – Advanced Computer Hardware Lab	4	120	40/100
C19WTPW/E19WTPW	Project Work	10	150	40/100

**Eligibility for admission:** Pass in 10<sup>th</sup>std examination conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamil Nadu or any other equivalent examination.

**Examination:** Passing Minimum for each Course is 40%. Classification will be done on the basis percentage marks of the total marks obtained in all the Courses and as given below:

40 % but less than 50 %	- Third class
50 % but less than 60 %	- Second class
60 % and above	- First class

### SYLLABUS

- Course I : Introduction to Computer Hardware  
Course II : Computer Hardware Maintenance  
Course III : Practical I -Basic Computer Hardware Lab  
Course IV : Practical II - Advanced Computer Hardware Lab  
Course V : Project Work

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### **Program Objectives**

- The student should be able to learn about the physical components of Computers which include the input, output, processor, storage, power supply and other control units

## Course I

### (C19WT11/E19WT01)INTRODUCTION TO COMPUTER HARDWARE

#### **OBJECTIVE:**

The student should be able to learn about the physical components of Computers which include the input, output, processor, storage, power supply and other control units

#### **UNIT I**

**18 Hrs**

**FUNDAMENTALS OF PC TECHNOLOGY :** Basic Electronics – Fundamentals – External I/O Connectors – Principles of CPU operation – Number Systems – Bus Concepts. Microprocessor – CPU operation – CPU Terminology – The PC Family Tree – Trouble shooting the CPU – Handling and Replacing CPU – CPU configuration – CPU Troubleshooting checklist.

#### **UNIT II**

**18 Hrs**

**MEMORY :** Working Principle – DRAM – SRAM – Memory Chips and Modules – DIPP – SIPP – SIMM – DIMM – SO – DIMM- SO – DIMM – SO – DIMM – RIMM – RAM – Module sizes and Banks of Memory – parity vs. Non – parity – Error Correction Code – DRAM Timing and Memory – Troubleshooting Memory – Memory Not Detected – Memory errors in applications – Advanced Memory Technologies – RDRAM – DDRAM – PPRAM

#### **UNIT III**

**18 Hrs**

**MOTHERBOARDS, POWER SUPPLY AND PROTECTION:** Motherboard Controllers and System Resources – Memory Map – I/O Ports – IRQ – DMA Control – I/O System Bus – ISA – MCA – EISA – PCI – APG – VESA – PCI – X On Board I/O Devices – Chipsets – ROM BIOS – ROM POST – CMOS Setup – Motherboard Physical Forms Factors – AT – ATX Motherboards – LPZ and NLX Form Factors – Specification/Form Factors – Power Supply – Ventilation and Cooling Protection – Processor Cooling – Temperature limits – Power Protection and Back Up- Power Protection Devices – Different Types of Motherboard currently used in PC's & their features.

#### **UNIT IV**

**18 Hrs**

**MASS STORAGE INTERFACE :** FDD – interface – FDD Controller – Power Cable – Control/Data Cable – Floppy Interface Problems – IDE Interface – ATA I/O cable Master/Slave Configuration – Data Transfer Modes – Large Drive Support – SCSI Interface – SCSI Bus – Magnetic Storage – Hard Disk – Drives – Floppy Disc Drives- Cartridge Drives, Optical Storage Media – CD – ROM – Drive Head – Head Actuator – Spindle Motor – ROM – Connectors – DVD – ROM – CD – R CD-RW – DVD – Current trend in Hardware

#### **UNIT V**

**18 Hrs**

**I/O PORTS :** I/O Ports and Devices – serial Port – Parallel Ports – IEEE 1284 – USB – USB Connectors – USB Support – IEEE 1394

#### **Reference Books:**

- 1 The Complete Reference PC Hardware, Craig Zacker & John Rourke, 2001, McGraw Hill, ISBN: 9780070436060, 0070436061
- 2 Trouble Shooting, Maintaining and Repairing PCs, Stephen J. Bigelow, McGraw Hill Education; 5 edition , 2017, **ISBN-10:** 0070473676; **ISBN-13:** 978-0070473676

## Course II

### (C19WT12/E19WT02)COMPUTER HARDWARE MAINTENANCE

#### **OBJECTIVE:**

The student should be able to:

- Learn about the maintenance of computer peripherals
- Learn the mechanisms of data recovery
- Understand the PC troubleshooting procedures

#### **UNIT I**

**18 Hrs**

**PC PERIPHERALS:** Modem – ISDN – CATV networks modem – DSL – Network Hardware – Printers – printers Types –Printer Attributes – Printer Maintenance – Scanners – UPS. Portable PC’s – Assembling – Troubleshooting Tools and Techniques – Basic Hardware Tools – Advance Tools – Software Tools – Preventive Maintenance – Weekly – Monthly.

#### **UNIT II**

**18 Hrs**

**INPUT DEVICES, VIDEO, AUDIO SUBSYSTEM:** Keyboards – Keyboard layout – Keyboard connectors – Keyboard Inter – face- Switch Types – Keyboard Troubleshooting – Pointing Devices – Pointing Device Interface Types – Pointing Device troubleshooting – Video Adapters – Text Mode and Graphics Mode – Video Adapter Characteristics – Video standards – video adapter components – Monitors – Monitors Types – Audio Application – Storing Sounds – Adapter Architecture – MIDI – Audio Adapter Standards.

#### **UNIT III**

**18 Hrs**

**PRINTERS:** Printer Types – Laser – Inkjet – Dot Matrix – Printer Attributes – Printer –Resolution – Page Description Language – Memory – Speed – Course Types – Combination Devices – Printers Maintenance – Laser Printer Maintenance - Inkjet Maintenance – DOT Matrix Maintenance.

#### **UNIT IV**

**18 Hrs**

**PC TROUBLESHOOTING:** Basics Hardware Tools – Advanced Tools – PC Handling Techniques – Handling Power Supply – ESD – Connecting the PC to the external environment.

#### **UNIT V**

**18 Hrs**

**BASIC DATA REVOERY AND DISASTER RECOVERY:** Partitions – Master boot Record – Partition Tables – Extended Partitions – Data Recovery and Disaster Recovery – Disk Structure and Data Recovery – FAT – Backup – Virus – Disaster Recovery – Preventive Maintenance – Backup Routines – Backup strategies – fault tolerance – consolidating data recovery with disaster recovery.

#### **Reference Books:**

**18 Hrs**

- 1 The Complete Reference PC Hardware, Craig Zacker & John Rourke, 2001, Mcgraw Hill, ISBN: 9780070436060, 0070436061
- 2 Trouble Shooting, Maintaining and Repairing PCs, Stephen J.Bigelow, McGraw Hill Education; 5 edition , 2017, **ISBN-10:** 0070473676; **ISBN-13:** 978-0070473676

### **Course III**

#### **(C19WTP1/E19WTP1)PRACTICAL I - BASIC COMPUTER HARDWARE LAB**

##### **List of Exercises**

1. Circuits Design Using RLC (Soldering)
2. De-Soldering and Soldering External I/O Connectors.
3. Designing AC to DC (SMPS) Converter using Electronics
4. Memory Chips Troubleshooting using Hardware Tools
5. Checking Floppy Drive and Troubleshooting
6. Head Cleaning and Head Aligning in CD – ROM
7. Adding & Removing Jumpers in Motherboard and Various Slots.
8. Checking ROMBIOS and Configure BIOS Data using CMOS
9. Checking and Cleaning Mouse, Keyboard, Floppy Driver
10. Checking Voltage and Rectifying Errors in ISA, PCI, AMR/CNR and AGP Slots.
11. Checking Motherboard and Troubleshooting

### **Course IV**

#### **(C19WTP2/E19WTP2)PRACTICAL II – ADVANCED COMPUTER HARDWARE LAB**

1. Checking and Repairing Internal and External Modem
2. Checking Printer, Scanner and Finding Errors.
3. Partitioning and Installing OS in Hard Disk using Familiar Tools.
4. Checking Motherboard and Troubleshooting
5. Adding New Hard disk and Configuring it
6. Data Recovery Using Familiar Tools
7. Checking error in Hard disk
8. Modifying Master Boot Record in Secondary Storage Devices
9. Tuning Monitor Adjustment using Variable Register
10. New Computer Assembling
11. Upgrading Memory Module 64 MB to 128 MB

### **Course V**

#### **(C19WTPW/E19WTPW)PROJECT WORK**

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