# DIPLOMA IN ELECTRONICS AND COMMUNICAITON ENGINEERING

**M - SCHEME**

**2015 - 2016**

## COMPUTER HARDWARE SERVICING AND NETWORKING

## DIRECTORATE OF TECHNICAL EDUCATION
## GOVERNMENT OF TAMILNADU

**(Implements from the Academic Year 2015-2016 onwards)**

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| **Course Name** | : Electronics and Communication Engineering |
| **Subject code** | : 34061 |
| **Semester** | : VI Semester |
| **Subject Title** | : COMPUTER HARDWARE SERVICING AND NETWORKING |

**TEACHING AND SCHEME OF EXAMINATION:**

**No. of Weeks per Semester: 15 Weeks**

| Subject | Instructions | | Examination | | | |
|---|---|---|---|---|---|---|
| | Hours / Week | Hours / Semester | Marks | | | Duration |
| | | | Internal Assessment | Board Examination | Total | |
| COMPUTER HARDWARE SERVICING AND NETWORKING | 6 | 90 | 25 | 75 | 100 | 3 Hours |

**Topics and Allocation of Hours:**

| Unit No | Topics | No. of Hours |
|---|---|---|
| I | MOTHERBOARD COMPONENTS AND MEMORY STORAGE DEVICES | 16 |
| II | I/O DEVICES AND INTERFACE | 16 |
| III | TROUBLE SHOOTING OF DESKTOP AND LAPTOPS | 16 |
| IV | COMPUTER NETWORK DEVICES AND OSI LAYERS | 16 |
| V | 802.X AND TCP/IP PROTOCOLS | 16 |
| | Revision and Examinations | 10 |
| | Total | 90 |

**Rationale:**

Maintaining and servicing the computers, laptops and peripherals are essential requirements of the computer students. The clear understanding of computer network devices and protocols are also taught in this subject.

**OBJECTIVES:**

On completion of the following units of syllabus contents, the students can

➢ Identify the major components of CPU.

➢ Understand the principle of operations of all the interfacing boards, IO/Memory slots and interfacing devices.

➢ Know the use of diagnostic Software.

➢ Trouble shoot the problems in Laptop.

➢ Understand the different layers of OSI and their functions. Compare different LAN protocols.

➢ Identify the protocols used in TCP /IP and compare with OSI model. Use of IP addressing and TCP/ IP protocols briefly.

## DETAILED SYLLABUS

| Unit No. | Name of the Topic | Hours |
|---|---|---|
| I | **MOTHERBOARD COMPONENTS AND MEMORY STORAGE DEVICES**<br>**Introduction:**<br>Hardware, Software and Firmware.<br>Mother board, IO and memory expansion slots, SMPS, Drives, front panel and rear panel connectors.<br>**Processors:**<br>Architecture and block diagram of multicore Processor, Features of new processor(Definition only)-chipsets (Concepts only)<br>**Bus Standards:**<br>Overview and features of PCI, AGP, PCMCIA<br>**Primary Memory**: Introduction-Main Memory, Cache memory – DDR2, DDR3 and Direct RDRAM.<br>**Secondary Storage:** Hard Disk – Construction – Working Principle Specification of IDE, Ultra ATA, Serial ATA; HDD Partition - Formatting.<br>**Removable Storage:**<br>CD-R,CD-RW,DVD –ROM and DVD –RW**:** construction and reading & writing operations;<br>Blue-ray – Introduction –Disc Parameters. | 16 |
| II | **I/O DEVICES AND INTERFACE**<br>**Keyboard:** Signals – operation of membrane and mechanical keyboards–troubleshooting; wireless Keyboard.<br>**Mouse:** types, connectors, operation of Optical mouse and Troubleshooting.<br>**Printers**: Introduction – Types of printers- Dot Matrix, Inkjet, Laser, MFP (Multi Function Printer) and Thermal printer – Operation, Construction and  Features-Troubleshooting<br>**I/O Ports:** Serial, Parallel, USB, Game Port and HDMI.<br>**Displays:** Principles of LED, LCD and TFT Displays.<br>**Graphic Cards:** VGA and  SVGA card.<br>**Modem:** Working principle.<br>**Power Supply:** Servo Stabilizers, online and offline UPS - working principles;  SMPS: Principles of Operation and block diagram of ATX Power supply, Connector Specifications. | 16 |
| III | MAINTENANCE AND TROUBLE SHOOTING OF DESKTOP AND LAPTOPS<br>**Bios-setup:** Standard CMOS setup, Advanced BIOS setup, Power | |

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| | | management, advanced chipset features, PC Bios communication – upgrading BIOS, Flash BIOS -setup.<br>**POST:** Definition – IPL hardware – POST Test sequence – beep codes<br>**Diagnostic Software and Viruses:** Computer Viruses – Precautions –Anti-virus Software – identifying the signature of viruses – Firewalls and latest diagnostic softwares.<br>**Laptop:** Types of laptop –block diagram – working principles– configuring laptops and power settings -SMD components, ESD and precautions.<br>**Laptop components:** Adapter – types, Battery – types, Laptop Mother Board - block diagram,Laptop Keyboard and Touchpad .<br>**Installation and Troubleshooting:** Formatting, Partitioning and Installation of OS – Trouble Shooting Laptop Hardware problems - Preventive maintenance techniques for laptops. | **16** |
| IV | | **COMPUTER NETWORK DEVICES AND OSI LAYERS**<br>**Data Communication:** Components of a data communication .<br>**Data flow:** simplex – half duplex – full duplex;<br>**Topologies:** Star,Bus, Ring, Mesh, Hybrid – Advantages and Disadvantages of each topology.<br>**Networks:** Definition -Types of Networks: LAN – MAN – WAN – CAN – HAN – Internet –Intranet –Extranet, Client-Server, Peer To Peer Networks.<br>**Network devices:** Features and concepts of Switches – Routers(Wired and Wireless) – Gateways.<br>**Network Models:** Protocol definition - standards - OSI Model – layered architecture – functions of all layers. | **16** |
| V | | **802.X AND TCP/IP PROTOCOLS**<br><br>**Overview of TCP / IP:**TCP/IP – Transport Layers Protocol – connection oriented and connectionless Services – Sockets - TCP & UDP.<br>**802.X Protocols :** Concepts and PDU format of CSMA/CD (802.3) – Token bus (802.4) – Token ring (802.5) – Ethernet – type of Ethernet (Fast Ethernet, gigabit Ethernet) – Comparison between 802.3, 802.4 and 802.5<br>**Network Layers Protocol:** IP –Interior Gateway Protocols (IGMP, ICMP, ARP, RARP Concept only).<br>**IP Addressing :** Dotted Decimal Notation –Subnetting & Supernetting.<br>**Application Layer Protocols:** FTP– Telnet – SMTP– HTTP – DNS -pop | **16** |

**TEXT BOOKS:**

1. IBM PC and CLONES, B.Govindrajalu, Tata McGrawhill Publishers, IBM PC and CLONES
2. Computer Installation and Servicing, D.Balasubramanian, Tata McGraw Hill
3. Computer Installation and Servicing
4. The complete PC upgrade and Maintenance, Mark Minasi, BPB Publication, The complete PC upgrade and Maintenance
5. Troubleshooting, Maintaining and Repairing PCs, Stephen J Bigelow ,Tata MCGraw Hill Publication ,Troubleshooting Maintaining and Repairing PCs
6. Upgrading and repairing laptops, Scott Mueller, QUE Publication, Upgrading and repairing laptops
7. Data Communication and networking, Behrouz A.Forouzan, Tata Mc-Graw Hill, New Delhi,
8. Data and Computer Communications, William Stallings, Prentice-Hall of India, Eighth Edition
9. Computer Networks, Andrew S.Tanenbaum, Prentice-Hall of India, New Delhi,

**REFERENCE BOOKS:**

1. Computer Networks,Achyut Godbole,Tata Mc-Graw Hill -New Delhi

2. Principles of Wireless Networks– A unified Approach, Kaveh

   Pahlavan and Prashant Krishnamurty, Pearson Education, 2002

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