# S. Y. B. Sc. (C.H.N.A.) Credit System Syllabus
# To be implemented from June 2020

**(CBCS Pattern)**

**Structure of S. Y. B. Sc. Vocational Course COMPUTER HARDWARE AND NETWORK ADMINISTRATION**

| Sem | Paper Code | Paper | Paper Title | credits | Lectures/Week | | | Evaluation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Th | Tut | Pr. | CA | UE | Total |
| III | CHNA-231 | I | Operating System & Diagnostics Tools | 2 | 3 | - | - | 15 | 35 | 50 |
| | CHNA-232 | II | Microprocessor & Interfacing-I | 2 | 3 | - | - | 15 | 35 | 50 |
| | CHNA-233 | III | CHNA Lab-IA | 2 | - | - | 4 | 15 | 35 | 50 |
| IV | CHNA-331 | I | Networking Fundamentals | 2 | 3 | - | - | 15 | 35 | 50 |
| | CHNA-332 | II | Microprocessor & Interfacing-II | 2 | 3 | - | - | 15 | 35 | 50 |
| | CHNA-333 | III | CHNA Lab-IB | 2 | - | - | 4 | 15 | 35 | 50 |

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-III**

**Paper - I: Operating System & Diagnostics Tools (2 credits)**

Credits: 02 (Marks -50)

Teaching Scheme: 3 Lectures/ week Hours: 36 Lectures of 50 minutes

Objectives:

1. To understand the basics of operating system and its installation.
2. To be able to use MS-Office, Corel-Draw, Auto-CAD and Internet Browsers softwares.
3. To learn the programming languages C and C++.
4. To understood the installation procedure of different devices
5. To understood the different PC diagnostic tools

| Unit | Contents | Lectures |
|---|---|---|
| 1 | **Operating System Basics & Installation**<br>Introduction to OS, Types of Operating systems, System files FAT and NTFS, Dos 6.22, Windows 8, windows 10 and RedHat Linux and Multi Boot Operating System | 10 |
| 2 | **Introduction to software's**<br>MS-Office, Corel-Draw X3, Auto-CAD, Visual Studio, Internet Browsers, Google Chrome, Mozilla Firefox<br>Introduction to programming languages C & C++ | 8 |
| 3 | **Device Installation**<br>Graphics Card, Wireless LAN Card, SCSI Card, External Drive, Flash Cards, Web Camera, Mobile Devices, Pen Drive, Firewire Cards, Modem, Access Point. | 8 |
| 4 | **Diagnostic Tools & PC Maintenance**<br>Introduction, Virus and its types, Effect of Virus for Computer System, Scanning and Antivirus remover tools, Safety and Preventive Maintenance Tools, Data Recovery, PC care and Maintenance, Electrical Power Issues, Troubleshooting PC Hardware: - O/S Troubleshooting issues in computer System | 10 |
| | **Total** | **36** |

**Reference books:**


1. Windows XP Professional edition complete, BPB Publication
2. Office XP complete, BPB publication
3. Computer Fundamentals by P. K. Sinha
4. Upgrading and Repairing of PCs by Scott Muller

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-III**

**Paper -II: Microprocessor & Interfacing - I (2 credits)**

Credits: 02 (Marks -50)

Teaching Scheme: 3 Lectures/ week Hours: 36 Lectures of 50 minutes

**Objectives:**

1. To know Microprocessor and Interfacing of various Components, Networking Connections etc
2. To learn hardware components and latest development in the field
3. To learn BUS architecture, memories, EDA tools
4. To study different types of sensors and data conversion techniques.

| Unit | Contents | Lectures |
|---|---|---|
| 1 | **Computer, Microcomputers & Microprocessors**<br>– An Introduction & Overview – Structure & Operation Specification of new processors:<br>– Intel Processors: Dual Core, Core i3/i5/i7 Family, Intel 2nd , 3rd & 4th Generation Processors, Xeon Processors.<br>– Non-Intel Processors: Advanced Micro Devices (AMD), ARM based Processors, iMAC, (Apple Macintosh) | **10** |
| 2 | **BUS Architecture and interrupts**<br>- Advanced Systems BUS Architecture<br>– PCI, IDE, USB 2.0 & 3.0, ATA, SATA, eSATA, HDMI<br>- Interrupts & Interrupt Applications of 8086 Processor<br>- Software Interrupt Applications. | **08** |
| 3 | **Digital & Analog Interfacing**<br>– Programmable parallel Ports & Handshake Input Output<br>– Interfacing Microprocessors to Keyboard<br>– Interfacing to Alphanumeric Displays<br>– Sensors and Transducers<br>– DAC & ADC Converters: Specifications & Types, Interfacing & Types of Interfacing. | **12** |
| 4 | **Memories and EDA Tools**<br>The 8086 Max Mode, DMA Transfers, Interfacing & Refreshing DRAMs, Cache Memory Concepts, Computer Based design & Development Tools. | **06** |
| | **Total** | **36** |

**Reference books:**


1. Assembly Language for PC – John Socha, Peter Norton
2. Microprocessor and Interfacing- D.V. Hall
3. The 8086 Microprocessor Programming and Interfacing the PC –K. Ayala
4. Programming with X86 processor –Venugopal
5. PC Hardware (A+ Certificate guide) by Mike Mayer
6. PC Hardware interfaces by Michael Gook
7. Computer Fundamentals by P. K. Sinha
8. Upgrading and Repairing of PCs by Scott Muller

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-IV**

**Paper - I: Networking Fundamentals (2 credits)**

Credits: 02 (Marks -50)

Teaching Scheme: 3 Lectures/ week Hours: 36 Lectures of 50 minutes

**Objectives:**

1. To learn networking and related hardware.
2. To be able to install network hardware and software.
3. To learn network related protocols and services.
4. To be familiar with transmission media and topologies.

| Unit | Contents | Lectures |
|---|---|---|
| 1 | **Networking and Network Hardware**<br>Introduction to networks and networking, LAN, WAN, Internet and Intranet. Uses and benefits of Network, Server-client based network, peer to peer networks. Concept of Server, client, host. Analog and Digital transmission, Network Interface Card, Repeaters, Hub, Routers, Bridges | 12 |
| 2 | **Network Installation**<br>Installing Network Operating System Windows 2003 Server and Windows 2008 Server, Cable Crimping, Network Sharing and user Permission, Internet Connection, E-Mail, Cloud Networking, Google Drive, SkyDrive, Dropbox. | 8 |
| 3 | **Protocols and Services**<br>HTTP, FTP and other Different types of protocols, OSI Model, Media Access Method, DNS services, DHCP services, WINS services and RAS services, Web services, Proxy Services etc | 8 |
| 4 | **Transmission Media and Topologies**<br>Media types: STP cable, UTP cable, Coaxial cable, Fiber cable, Base band and Broadband transmission, Cables and Connectors, Physical and logical topologies, Bus, Star, Ring and Mesh topologies | 8 |
| | **Total** | 36 |

**Recommended Books:**

1. Networking Complete,BPB Publication
2. Computer Networking Andrew S. Tanenbawan By PHI
3. Computer Fundamentals by P. K. Sinha
4. Upgrading and Repairing of PCs by Scott Muller

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-IV**

**Paper - II: Microprocessor & Interfacing - II (2 credits)**

Credits: 02 (Marks -50)

Teaching Scheme: 3 Lectures/ week Hours: 36 Lectures of 50 minutes

**Objectives:**

1. To understand basic concept & structure of Computer Hardware & Networking Components
2. To identify the existing configuration of the computers & peripherals
3. To know how to troubleshoot Computer and Networks
4. Conducting basic diagnostic routines using various tools and application software, Perform routine and preventive maintenance

| Unit | Contents | Lectures |
|---|---|---|
| 1 | **New PC Standards**<br>Green PC: Introduction, Advantages, Thick & Thin concept. Introduction to NComputing Concept and devices,<br>Multimedia PC: Introduction, Minimum Requirements, MPEG Terminology, Enhanced Devices & interfaces, Sound Cards, MIDI Ports.<br>Displays: Display Adaptors, Display Systems<br>Controllers: Peripheral Controllers, System Controllers, Memory Controller, Disk Drive Controller<br>BIOS: Legacy, Flash BIOS, Embedded IO systems – Introduction to win8/Android/IOS | 12 |
| 2 | **Computer Systems peripherals**<br>Micro Computer Displays,<br>Input Devices: Keyboards, Mouse, Scanners, Card Readers etc.<br>Output Devices: Printers, Displays, Plotters etc.<br>Storage Devices: Magnetic Disks, Optical Disk Data Storage, Flash Drives etc.<br>Various ADD ON Cards. (Graphics Card, Wireless NIC, Ethernet Card, Audio) | 08 |
| 3 | **Data Transmission**<br>Speech Synthesis and Recognition Concepts.<br>Introduction to Asynchronous Data Communications<br>Synchronous Serial Data Communication & Protocols<br>Concepts of Personal Area Network(PAN),Local Area network(LAN) & Wide Area Network(WAN) | 10 |
| 4 | **Wireless Communications Concepts**<br>Introduction to Wireless Communication Concepts & Protocols<br>RFID: working of RFID system, types of RFID tags, applications<br>Study of Remote Desktop Sharing Tools | 06 |
| | **Total** | 36 |

**Recommended Books:**

1. IBM PC and Clones by B. Govindrajalu
2. PC Hardware (A+ Certificate guide) by Mike Mayer
3. PC Hardware interfaces by Michael Gook
4. Computer Fundamentals by P. K. Sinha
5. Wireless Communications Principles and Practice, Pearson publication

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-III**

**Paper - III: CHNA Lab-IA (2 credits)**

Credits: 02 (Marks -50) Hours: 4hours 20 minutes

**Instruments:**

1. PC with printer scanner, web camera
2. Computers Software and Hardware
3. Antivirus software , CRO, Multimeter
4. Interfacing devices

**Methodology of conducting practical:**

Each practical will be of duration 4 hours and 20 minutes. Teachers should utilize the allotted time as follows

1. Two experiments per practical session which includes one long and one short experiment
2. Time utilization for practical

| Hours | Details |
|---|---|
| Long experiment | |
| 1 | • Understanding software and hardware methodology OR Developing Algorithm and flowchart of the program<br>• Writing the program |
| 2 | • Implementation of circuit on kit<br>• Connecting and testing the assembling ,Program execution |
| Short Experiment | |
| 2 hours and 20 minutes | • Printer/Scanner Driver installation<br>• Introduction to Dos Commands<br>• Antivirus installation<br>• PC servicing<br>• Introduction to BIOS setup . |

Number of students per batch: 12
University Examination : 35 marks
Continuous Internal Examination : 15 marks

Following are different methods of assessing the studies for internal practical examination

1. Oral
2. Journal
3. Mock tests
4. Attendance
5. Performance
6. Project/PLE/Industrial visit

## Semester I

## Activity : Industrial visit, educational tour , seminar ,workshop (any one)

## List of Practical's (Minimum 10, 5 from each group):

## Group A :( Minimum5/8)

1. Installation of Different Operating Systems : Windows XP, Windows 7
2. Troubleshooting and Repair Operating System : Windows XP, Windows 7
3. Installation of Ms Office 2003, Ms-Office 2007 and Ms-Office 2010
4. Installation of Web Camera and CCTV Camera Drivers and Software
5. To Repair and Troubleshooting of SMPS, Monitor, Printer and Motherboard
6. Installation Dual Operating System like: Windows XP and Windows 7
7. Tacking Data Backup and System Formatting and OS Installation
8. Installation and configuring Peer to Peer and Server-Client Network

## Group B: (Minimum 5/8) Practicals should be done with TASM/ NASM

1. Arithmetic operations of 8 bit / 16 bit .
2. Logical operation 8 bit only
3. Largest and smallest number in given array.
4. Arranging string in ascending and descending order.
5. Block of data transfer between memory to memory
6. Code conversion : Decimal to Binary, Gray to Binary
7. Writing driver programs for mouse operation
8. Writing com program

**S.Y.B.Sc. (Computer Hardware & Network Administration (Vocational))-Semester-IV**

**Paper - III: CHNA Lab-IB (2 credits)**

Credits: 02 (Marks -50) Hours: 4hours 20 minutes

## Semester II

**Instruments:**

1. PC with printer scanner, web camera
2. Computers Software and Hardware
3. Antivirus software , CRO, Multimeter
4. Interfacing devices

**Methodology of conducting practical:**

Each practical will be of duration 4 hours and 20 minutes. Teachers should utilize the allotted time as follows

1. Two experiments per practical session which includes one long and one short experiment
2. Time utilization for practical

| Hours | Details |
|---|---|
| Long experiment | |
| 1 | • Understanding software and hardware methodology OR Developing Algorithm and flowchart of the program<br>• Writing the program |
| 2 | • Implementation of circuit on kit<br>• Connecting and testing the assembling ,Program execution |

| Short Experiment | |
|---|---|
| 2 hours and 20 minutes | • Printer/Scanner Driver installation<br>• Introduction to Dos Commands<br>• Antivirus installation<br>• PC servicing<br>• Introduction to BIOS setup . |

Number of students per batch: 12

**Evaluation Process:**

- University Examination : 35 marks
- Continuous Internal Examination : 15 marks

Following are different methods of assessing the studies for internal practical examination

1. Oral
2. Journal
3. Mock tests
4. Attendance
5. Performance
6. Project/PLE/Industrial visit

## Activity : Industrial visit, educational tour , seminar ,workshop (any one)

## List of Practical's (Minimum 10, 5 from each group):

## Group A :( Minimum 5/8)

1. **Software Installation:** NASM, Tally, Acrobat etc Installation of CD-DVD Burning Software like: Nero 7.0 & PowerISO 4.0
2. **Remote Desktop Sharing –** Using Teamviewer, ShowmyPC, Ammyy Admin Desktop, Remote Assistance, Telnet, HyperTerminal
3. **Network Sharing:** Share a Drive on LAN, Share a Printer on LAN, Share a Folder on LAN
4. **Antivirus:** Need, Installation and Updation types
5. **LAN:** Site Preparation for Installation of LAN
6. **Trouble Shoot** a Virus infected PC using a Antivirus Program (Free ware : AVAST, Fire Threat)
7. Installation of On Board and PCI Device Driver
8. Configuring ADSL+2 Router for BSNL Internet Connectivity

## Group B: (Minimum 5/8)

**Practicals should be done with TASM/ NASM**

1. Interfacing : Seven segment display,LED
2. Interfacing :LCD
3. Interfacing: Stepper motor interfacing DC motor
4. Program : BIOS interrupt ,
5. Interfacing with PC ports
6. Study of USB communication
7. Study of Various Android Applications – Any 10
8. Study of Wireless Communication and protocols