

Vocational Course

Syllabus

**COMPUTER HARDWARE
AND
NETWORK ADMINISTRATION**

S. Y. B. Sc. (From 2014-2015)

Ad-hoc Board of Studies in Vocational Courses

Introduction

The vocational stream is specialized in the sense of being non-conventional. It is multi faculty as well as multidisciplinary. It is necessary for Board to have a wholistic view and integrated approach. The board is aware that the courses are different also because they are incorporated into conventional disciplines. They establish a linkage with main stream disciplines, market and industry. The theme paper that follows reflects all the above ideas.

The idea of vocationalization at the undergraduate level was introduced by UGC in 1994. The main aims were:

1. to promote the possibility of self employment
2. to bridge up the gap between knowledge based conventional education and market demands and to provide an alternative to those pursuing higher education.

The University of Pune positively responded to the UGC guidelines and introduced vocational courses in the three faculties of conventional graduation, namely Arts, Commerce and Science.

There has been a significant phase in the implementation of the vocational programme and more than 30 colleges offer different courses under various disciplines. A sizable number of students offered these courses since their inception and have had gainful employment. Currently the following courses are conducted in various moficil as well as urban colleges affiliate to the University of Pune.

The details of the programmes are as follows:

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

Objectives:

- A. To know fundamentals of Computer and Organization of Hardware and Software
- B. To know Microprocessor, Programming and Interfacing of various Components, Networking Connections etc
- C. To know how to troubleshoot Computer and Networks,
- D. Installation of various drives and operating systems.

SUMMARY CHART

Year	Paper	Term/ Semester	Title of the Paper
First	1		Essentials of Computer
First	2		Computer Organization (Hardware & Software Aspects)
First	3		Practicals based on the above papers and Assignments on Computer Literacy, Communication Skills & Personality Development.
Second	1	I	Microprocessor & Interfacing Techniques I
Second	2	I	Computer System Administration I
Second	1	II	Microprocessor & Interfacing Techniques II
Second	2	II	Computer System Administration II
Second	3	I & II	Practicals based on the above papers and Assignments on Intelligence Ability Development, Communication Skills & Personality Development.
Third	1	III	Computer Service Management
Third	2	III	Networking I
Third	1	IV	Entrepreneurship Development
Third	2	IV	Networking II
Third	3	III & IV	Practicals based on the above papers and Preparation of a Small Business Model

COMPUTER HARDWARE AND NETWORK ADMINISTRATION

Class: S. Y. B. Sc.

Syllabus for S.Y B.Sc. (2014-2019)

Computer Hardware & Network Administration (Vocational)

Paper-I: Microprocessor & Interfacing Techniques

Objective: To make students aware of the **minimum** level of hardware, peripherals & interfacing concepts.

Paper-II: Computer System Management

Objective: To prepare students for computer system maintenance and recovery procedures in case of system failure.

Paper-III: Practical Course

Objective: To get hands on experience of computer hardware and networking and expose them to real time applications.

Paper-I: Microprocessor & Interfacing Techniques

Term -I: Microprocessor & Interfacing Techniques – I

- | | |
|---|------|
| Unit 1: Computer, Microcomputers & Microprocessors | 22 L |
| <ul style="list-style-type: none"> - An Introduction & Overview – Structure & Operation - Specification of new processors: <ul style="list-style-type: none"> o Intel Processors: Dual Core, Core i3/i5/i7 Family, Intel 2nd , 3rd & 4th Generation Processors, Xeon Processors. o Non-Intel Processors: Advanced Micro Devices (AMD), ARM based Processors, iMAC, (Apple Macintosh) - Advanced Systems BUS Architecture <ul style="list-style-type: none"> o PCI, IDE, USB 2.0 & 3.0, ATA, SATA, eSATA, HDMI - Interrupts & Interrupt Applications of 8086 Processor - Software Interrupt Applications. | |
| Unit2: Digital & Analog Interfacing | 18 L |
| <ul style="list-style-type: none"> A. Programmable parallel Ports & Handshake Input Output. B. Interfacing Microprocessors to Keyboard, C. Interfacing to Alphanumeric Displays. D. Sensors and Transducers E. DAC & ADC Converters: Specifications & Types, Interfacing & Types of Interfacing | |
| Unit3: Memories and EDA Tools | 8L |
| <ul style="list-style-type: none"> 1. The 8086 Max Mode, DMA Transfers, Interfacing & Refreshing DRAMs, Cache Memory Concepts, Computer Based design & Development Tools. | |

Term -II: Microprocessor & Interfacing Techniques –II

- Unit 1: New Standards** 8 L
1. Green PC: Introduction, Advantages, Thick & Thin concept. Introduction to N-Computing Concept and devices,.
 2. Multimedia PC: Introduction, Minimum Requirements, MPEG Terminology, Enhanced Devices & interfaces, Sound Cards, MIDI Ports.
 3. Displays: Display Adaptors, Display Systems
 4. Controllers: Peripheral Controllers, System Controllers, Memory Controller, Disk Drive Controller
 5. BIOS: Legacy, Flash BIOS,
 6. Embedded IO systems – Introduction to win8/Android/IOS
- Unit2: Computer Systems peripherals** 18 L
1. Micro Computer Displays
 2. Input Devices: Keyboards, Mouse, Scanners, Card Readers etc.
 3. Output Devices: Printers, Displays, Plotters etc.
 4. Storage Devices: Magnetic Disks, Optical Disk Data Storage, Flash Drives etc.
 5. Various ADD ON Cards. (Graphics Card, Wireless NIC, Ethernet Card, Audio)
- Unit3: Communications** 22 L
1. Speech Synthesis and Recognition Concepts.
 2. Introduction to Asynchronous Data Communications
 3. Serial Data Communication Methods & Standards.
 4. Synchronous Serial Data Communication & Protocols
 5. Concepts of Personal Area Network(PAN),Local Area network(LAN) & Wide Area Network(WAN)
 6. Introduction to Wireless Communication Concepts & Protocols
 7. Study of Remote Desktop Sharing Tools

Paper-II: Computer System Management

Term -I: Computer System Management - I

- Unit1: Preventive Maintenance** 16 L
- Contributors to Failures
- Environmental: Heat, Cold, Dust, Noise Interference
 - Electrical: Power Line problems, EMI, Corrosion, Magnetism,
- Storage Devices:
- Hard Disk Drive Maintenance
- Floppy Disk Drive Head Cleaning
 - Flash Drives (USB Pen Drives, MMC cards)
- Preventive Maintenance of PC:- (Hardware & System Software)
- Power Supply Maintenance: Stabilizers, UPS, SMPS, Cables
- Preventive Maintenance of Printers.
- Unit 2: Trouble Shooting** 22 L
- Introduction to Basic trouble shooting
 - General Trouble Shooting Rules
 - Personal Attitude for Trouble Shooting
 - Need of Situation
 - Software Interrupt Applications.

- Common Troubles with Modern PC
- Component Failure Recovery.
 - o Disk Drive Failure
 - o Display Failure
 - o Motherboard & RAM Failure
 - o Port Failures (Parallel, Serial & USB Ports)
 - o Repair Generated Failure
 - o Fault Finding & General Repairs
- Safety Precautions during trouble shooting & repairs
- H/w & S/w fault isolation Techniques
- Diagnostic Software Programs & Utilities.
- Specific Trouble Shooting & Repairs
 - o Start up Problems
 - o Run Problems
 - o Display Problems: Adaptor Cards (PCI & AGP), Device Driver Configuration, Graphics Resolution, Graphics Accelerator board.
 - o Disk Drive Problems (HDD, CDRoms, FDD, Writers etc.
 -) o Keyboard & Mouse trouble Shooting.
 - o Printer Problems

Unit3: Introduction to Business Continuity Process & Disaster Recovery Planning 10 L

- Preventive Maintenance Schedules.
- Causes for Incidents & Disaster
- Minimize & Recovery Alternatives
 - o Access Controls: Logical & Physical
 - i) Backup & Restore Policies, Procedure & Implementations
- Importance of Disaster Recovery Plan

Term -II: Computer System Management – II

Unit1: Classification of Computer Systems

20 L

- Heartware:
 - o Types of Users
 - o Their Roles and Responsibilities
 - o Information System Organizational Structure
 - o Segregation of Duties and Control Matrix.
- Hardware:
 - o Computer Systems: Desktop(Clients), Servers, Mainframes
 - o Networks Devices: Cables, HUB, Switches, Routers, Modems,
- Software:
 - o System Softwares
 - o Device Drivers
 - o Database Softwares
 - o Application Softwares
 - o Utility Softwares

Unit 2: Management of Hardware Devices

18 L

- Desktop Systems:
 - o List of Components
 - o Assembly Procedures & Steps
 - o Installation of Operating System
 - o Installation of Device Drivers
 - o Installing Printers
- Need of Upgradation
- Various Portable Devices
 - o PDAs, Palm Tops, Notebooks, Laptops, BlackBerry & iPhone Devices
 - o Tablet PC's and its Application
 - o USB Pen Drives, Flash Memories
 - o Study of Android OS and its various Applications.
- Various Accessories
 - o Bluetooth Devices: Headphone, MIC, Printers, Interface Dongles, Keyboard, mouse, Cameras
 - o USB: Keyboards, Mouse, Cameras, Printers, Modems, Wi-Fi Interfaces

Unit3: Operations Management

10 L

- Computer Operations
 - o Operation Controls
 - o Scheduling Controls
 - o Maintenance Controls
 - o Change Process
- Network Operations
 - o Local Area Network Controls
 - o Wide Area Network Controls.
 - o Network Resources Sharing
- Storage of Storage Media, Maintenance & Disposal of Storage Media

Paper –III: Practical Course**List of Practicals:****Section - I****Practicals should be done with TASM/ NASM**

1. Arithmetic Programs
2. Code Conversion Programs
3. Program for strings and arrays
4. Programs with DOS interrupt
5. Program with BIOS interrupt
6. Writing driver programs for mouse operation
7. Writing Com program
8. Interfacing with PC ports
9. Study of USB communication
10. Study of Various Android Applications – Any 10
11. PC to PC communication

