

**University of Pune**

**F.Y.B.Sc.**

**Vocational Course**

# **Computer Hardware and Network Administration**

**Syllabus revision**

**To be implemented from June 2013**

## Vocational Course

# 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

### F.Y.B.Sc. Papers

Paper 1 Essentials of Computer

Paper 2 Computer Organization (Hardware & Software Aspects)

Paper 3 Practicals based on the above papers and Assignments on Computer Literacy, Communication Skills & Personality Development.

### S.Y.B.Sc. Papers

#### Semester - I

Paper 1 I Microprocessor & Interfacing Techniques I

Paper 2 I Computer System Administration I

#### Semester –II

Paper 1 Microprocessor & Interfacing Techniques II

Paper 2 II Computer System Administration II

#### Semester I+II

Paper 3 Practicals based on the above papers and Assignments on Intelligence Ability Development, Communication Skills & Personality Development.

### T.Y.B.Sc. Papers

#### Semester - I

Paper 1 Computer/ IT Service Management

Paper 2 Networking I

#### Semester - II

Paper 1 IV Entrepreneurship Development

Paper 2 IV Networking II

#### Semester I+II

Paper 3 III & IV Practicals based on the above papers and Preparation of a Small Business Model

1) **Title of the Course** : Computer Hardware and Network Administration

**2) Preamble:**

The systematic and planned curricula from first year to the third year shall motivate and encourage the students for expertization in computer maintenance and Network administration and for becoming an enterprenur.

**3) Introduction:**

At **first year of under-graduation**The basic topics related to the fundamentals of computer are covered. Since aims and objectives of vocational course is to create professional hands on while persuing undergraduate degree three years syllabus for vocational course Computer Hadware and Network Administration is planned.The practical course is intended to achieve the basic skills required for handling practical situations. Hence two mandatory activties are also added in practical course.

At **second year under-graduation**: The level of the theory and practical courses shall be one step ahead of the first year B.Sc. Courses based on content of first yearshall be introduced. Computers inside i.e. Microprocessors and programming alongwith network concepts are introduced I second year..

At **third year under-graduation**: In third year advanced topics of networking and computer service management is covered. In order to repare students mind for entrupenure Entrepreneurship Development corse is added .

**4) Eligibility:**

- 1 **First Year B.Sc.:**Higher Secondary School Certificate (10+2) Science stream or its equivalent Examinationas per the University of Pune eligibility norms.
- 2 **Second Year B.Sc.:** Keeping terms of First Year of B. Sc. with Vocational course Computer hardware and Network administration as one of the subjects. Other students if they fulfill the conditions approved by the equivalence committee of Faculty of Science of the University of Pune are also eligible.
- 3 **Third Year B. Sc.:** Student shall pass all First Year B. Sc. courses and satisfactorily keeping terms of Second Year of B. Sc. with Vocational course Computer hardware and Network administration as one of the subjects.

**Note:** Admissions will be given as per the selection procedure / policies adopted by the respective college, in accordance with conditions laid down by the University of Pune.Reservation and relaxation will be as per the Government rules.

**5 A) Examination Pattern:**

**Class: F. Y. B. Sc.  
Vocational Course**

**Subject: COMPUTER HARDWARE AND NETWORK ADMINISTRATION**

Pattern of Examination: Annual

**Paper I: Essentials of Computers**

**Paper II: Computer Organization (Hardware and Software Aspects)**

**Paper III Practical Course**

Paper/ Course No.	Title	Total Number of lectures/practicals per year	Standard of passing		
			Internal marks out of <b>20</b>	External marks out of <b>80</b>	Total marks out of <b>100</b>
Theory Paper I	<b>Essentials of Computers</b>	Three lectures/Week (Total 72 lectures per year)	08	32	40 *
Theory Paper II	<b>Computer Organization (Hardware and Software Aspects)</b>	Three lectures/Week (Total 72 lectures per year)	08	32	40 *
Practical Paper	Practical	08 Practicals of 4 lectures in each term (16 practicals and two assignment / year)	08	32	40 *

\* Subject to compulsory passing in external examination and getting minimum 40 marks out of 100

Notes:

1. Total marks: Theory (100 + 100 ) = 200 marks
2. Total marks per year 200 (Theory) + 100 marks (practicals) = 300 marks
3. Internal marks for theory papers given on the basis of internal assessment tests and for practicals on internal assessment tests + journals + attendance + study /survey reports etc.

**Theory examination** will be of three hours duration for each theory course. There shall be 5 questions each carrying equal marks. The pattern of question papers shall be:

Question 1	8 sub-questions, each of 2 marks; answerable in 2 -3 lines and based on entire syllabus
Question 2, 3 and 4	4 out of 6– short answer type questions; answerable in 8 – 10 lines
Question 5	4 out of 6 – problem type question; answerable in numerical

**Internal examination:** Internal assessment of the student by respective teacher will be based on written test, 10 marks each term. The written test shall comprise of objective type questions – Multiple Type Questions, True / False, Definitions, Answer in Two or three line question (Describe/Explain). There shall be 20 questions.  
Practical: one internal assessment test + marks for journals + attendance + activity.

**Practical Examination:** Practical examination shall be conducted by the respective college at the end of the academic year. Practical examination will be of 6 hours duration (2-Sessions). Certified journal is compulsory to appear for practical examination. There shall be two expert and two examiners per batch for the practical examination.

### 5 B) Standard of Passing:

In order to pass in the first year theory examination, the candidate has to obtain 40 marks out of 100 in each course. (Minimum 32 marks out of 80 must be obtained in the University Theory Examination.)

### 5 C) ATKT Rules:

While going from F.Y.B.Sc. to S.Y.B.Sc. at least 8 courses (out of total 12) should be passed; however all F.Y.B.Sc. courses should be passed while going to T.Y.B.Sc. While going from S.Y.B.Sc. to T.Y.B.Sc., at least 12 courses (out of 20) should be passed (Practical Course at S.Y.B.Sc. will be equivalent to 2 courses).

### 5 D) Award of Class:

The class will be awarded to the student on the aggregate marks obtained during the second and third year in the principal subject only. The award of the class shall be as follows:

1	Aggregate 70% and above	First Class with Distinction
2	Aggregate 60% and more but less than 70%	First Class
3	Aggregate 55% and more but less than 60%	Higher Second Class
4	Aggregate 50% and more but less than 55%	Second Class
5	Aggregate 40% and more but less than 50%	Pass Class
6	Below 40%	Fail

**5 E) External Students:** There shall be no external students.

### 5 F) Setting question papers:

For F.Y.B.Sc. Computer Hardware and Network Administration course, theory papers I and II annual question papers shall be set by the University of Pune and assessment done at the respective colleges. Questions should be designed to test the conceptual knowledge and understanding of the basic concepts of the subject. For Practical Paper III, papers shall be set by the University of Pune and assessment done at the respective colleges.

**5G) Verification and Revaluation Rules:**

As per university Statues and rules for verification and revaluation of marks in stipulated time after declaration of the semester examination result.

**6) Course Structure:**

**Duration:** The duration of B.Sc. Degree alongwith vocational course Program shall be three years

F .Y.B.Sc. : 2 Theory + 1 Practical (Annual)

S .Y.B.Sc.: 2 Theory per semester + 1 Practical (Annual)

T .Y.B.Sc.: 2 Theory per semester + 1 Practical (Annual)

**a) Question Papers :****F.Y.B.Sc.Theory paper:**

University Examination – 80 marks (at the end of 2<sup>nd</sup> term)

Internal Examination – 20 marks

**S.Y / T.Y. - B.Sc.Theory paper:**

University Examination – 40 marks (at the end of each term)

Internal Examination – 10 marks

**F.Y. / S.Y / T.Y. - B.Sc.Practical Paper:**

University Examination – 80 marks (at the end of 2<sup>nd</sup> term)

Internal Examination – 20 marks

**b) Medium of Instruction:** The medium of instruction for the course shall be English.**7) Equivalence of Previous Syllabus:**

Old Course (2008 Pattern)	New Course (2013 Pattern)
<b>Paper I : Essentials of Computers</b>	<b>Paper I : Essentials of Computers</b>
<b>Paper II :Computer Organization (Hardware and Software Aspects)</b>	<b>Paper II :Computer Organization (Hardware and Software Aspects)</b>
PaperIII: Practical	PaperIII: Practical

**8) University Terms:** Dates for commencement and conclusion for the first and second terms will be declared by the University authorities. Terms can be kept by only duly admitted students. The term shall be granted only on minimum 75 percent attendance at theory and practical course and satisfactory performance during the term.**9) Qualification of Teachers:**M.Sc. Electronic Science or equivalent master degree in science with class/grades and NET/SET as per prevailing University/Government /UGC rules. Visiting faculties from computer / IT industries .

## 10) Detail Syllabus with Recommended Books:

### Syllabus

(To be implemented from Academic Year 2013-14)

Class: F. Y. B. Sc.

Vocational Course

**Subject: COMPUTER HARDWARE AND NETWORK ADMINISTRATION**

#### Paper I: Essentials of Computers

1. Functional Block Diagram, History, Evolution. (04)
2. An Overview of System and Components.  
CPU Cabinet: Power supply, SMPS, Motherboard, CPU, Cables and connectors, Main and auxiliary memory, Front and rear panel study.  
Input devices: wired /wireless Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode Scanner Camcorder. Output devices: Monitor (CRT, LCD/ LED Panel,) Printer: Dot Matrix, Inkjet, LASER, Thermal, Plotter, Barcode Printers, Sound devices (Speaker, Headphone, Bluetooth, dongle) (16)
3. CPU:  
Microprocessor as CPU, General block diagram of CPU, CPU bus system, Packing, Cooling, Sockets and slots, Comparative study of Microprocessor's features with evolutions, Microprocessor Operations:- Instruction Cycle, Data fetch, Address Decoding, Classification of Interrupts, Input Output Techniques, Device Controllers(DMA controller , Disk drive controller) (20)
4. Computer Memory and Memory Management Techniques:  
Types and characteristics, Classification, Semiconductor, Magnetic, Optical ROM and its types. RAM and its types: SDRAM, EDORAM, DDR Series, Flash RAM.  
Memory modules, SIMM and DIMMs.  
Secondary Memory: Hard Disc Drive, Floppy Disc, CDROM, CD R/W, DVD, Pen Drive, flash memories: Mini/micri SD Card.  
Formatting and Utility Tools for drivers. (16)
5. Basic Computer Structure and Communication inside Computer, MAR, MBR and Memory mapping, ALU, Control Unit (Concept of Micro programmed and Hardwired Control) (08)
6. Advanced Technology in Computers: - Server, client, Mainframe, Desktop, Notebook, Tablets etc. (08)

**Class: F. Y. B. Sc.**

**Vocational Course**

**Subject: COMPUTER HARDWARE AND NETWORK ADMINISTRATION**

**Paper II: Computer Organization (Hardware and Software Aspects)**

1. Introduction and Concepts:  
Hardware and Software, System Software, Application Software, Firmware, BIOS, POST sequence, Operating Systems, Program, Flow Charts, Loader, assembler, Compiler, Linker, Editor, Simulator, Emulator, Debugger, Device Drivers, Software Packages and Programming Languages. (08)
2. Operating System: Types and Functions.  
DOS – Introduction, Versions, DOS Commands, Internal, External, Root Directory. Windows – Introduction, Working with desktop, Control Panel settings. Introduction to RTO, LINUX: Basic Commands, Introduction to PHABLET and their OS: ANDROID OS, IOS. (14)
3. Microprocessor Study:  
8086 – Architecture, Instruction set, 80286, 80386, 80486. Introduction to advanced processors- i series. (12)
4. Chipset and Controllers:  
Chipsets, Keyboard controller, Super IO controller, Math Co processor, Clock Generator, Bus controller, PPI, Timer, Interrupt controller, Tristate buffers and Latches. (12)
5. Interfaces:  
HDC, CRT Controller, Serial and Parallel Interface, UART, USB, RS-232, introduction to Bluetooth devices, Wifi, HDMI, Mini USB, Micro USB. (12)
6. Multimedia, Networking and Internet:  
Networking: Concepts, Need, Types, Topologies, Protocols, Introduction to Network Interface Card and Network Operating Systems, Thick and Thin PC's, Virtual PC.  
Multimedia: Medium concept, Types, Multimedia Computer Systems.  
Internet: Concept, Different Connection types, Applications. (14)



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**Paper III Practical Course**

Note: All the assignments and practicals should be designed and conducted so that the student develops effective soft skills. This should include: Use of basic computer related skills, presentation skills and communication skills.

**List of Practical**

1. Site Preparation, Electrical Connections and use of Maintenance kit, Cable Maintenance, Connecting Keyboard, Mouse, Printer, Scanner, Multimedia components and make it working.
2. Identification of system, Explanation of system components: Motherboard  
1) Onboard controllers, 2) Add on controllers. (Drives, RAM, CMOS battery, SMPS, BIOS RAM, Chipset, Controllers.
3. Identification of cables, connectors and tools.
4. DOS based practical Internal External commands, Directory handling and Practical on AUTOEXEC. BAT and CONFIG.SYS files (Only Demo)
5. Desk top and control panel settings of windows operating system.
6. MS office: 3 practical. (Students are expected to be familiar with MS office.)
7. Practical based on MS Word, Excel.
8. Practical based on Power Point.
9. Assembly and disassembly of computer.
10. Identification and verification and Detailed Study of Disc drives.
11. Study of Formatting, Scheduled Tasks, Defragmentation, Bootable disk.
12. Installation of Linux OS as a Desktop.
13. Assembly and maintenance of Dot matrix printer, Hardware study of Inkjet printer, LASER printer.
14. Use of Internet, search engines and e-mail.
15. Study of Power Supply : Types, Concepts of Fuse, MCB, Stabilizer, UPS, SMPS and checking of Different voltages, Power Good Signal
16. Study of BIOS and POST Sequence (Only Demo) and Standard CMOS setup for different configuration

17. Installation of device drivers for Mouse / printer / scanner / pen drive / CD- Combo and Checking hardware and software components and working with multimedia.

### **Mandatory Assignments for every student:**

- a) Prepare and give a presentation after doing market survey using Power Point tools (comparative study) for the latest computer configuration.
- b) Technical Data survey of Computer Hardware and network tools.

### **References: (For Paper I, II and III)**

1. Computer Fundamentals, P. K. Sinha
2. Upgrading and Repairing of PCs, Scott Muller
3. IBM PC and Clones, B. Govindrajalu
4. Microprocessor and Interfacing, D. V. Hall
5. Microprocessor X 86 Programming, Venugopal
6. Computer Motherboard Testing and Fault finding, S. K. Gupta
7. PC Hardware (A+ Certificate guide), Mike Mayer
8. PC Hardware interfaces, Michael Gook

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