

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

TEACHING AND EXAMINATION SCHEME

COURSE NAME : POST DIPLOMA IN COMPUTER APPLICATIONS

COURSE CODE : CA

DURATION OF COURSE : THREE SEMESTERS/ONE AND HALF YEAR

WITH EFFECT FROM 2008-2009

SEMESTER : THIRD

DURATION : 16 WEEKS

FULL TIME / PART TIME : FULL TIME

SCHEME - C

SR NO	SUBJECT TITLE	SUBJECT CODE	TEACHING SCHEME			EXAMINATION SCHEME											
			TH	TU	PR	PAPER HRS	TH		TEST	TOTAL		PR		OR		TW	
							MAX	MIN		MAX	MIN	MAX	MIN	MAX	MIN		
1	Computer Maintenance	9731	04	--	02	3	80	28	20	100	40	--	--	25@	10	--	--
2	Computer Networking	9732	04	--	02	3	80	28	20	100	40	--	--	25@	10	--	--
3	Operating System	9733	04	--	04	3	80	28	20	100	40	50#	20	--	--	25@	10
4	Project AND Seminar	--	--	--	06	--	--	--	--	--	--	--	--	50#	20	50@	20
5	Professional Practices	--	--	--	05	--	--	--	--	--	--	--	--	--	--	50@	20
Total			12	--	19	--	240	--	60	300	--	50	--	100	--	125	--

STUDENT CONTACT HOURS PER WEEK (FORMAL TEACHING): **31HRS.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

@ - INTERNAL ASSESSMENT, # - EXTERNAL ASSESSMENT,

TOTAL MARKS – 575

ABBREVIATIONS : TH – THEORY, TU – TUTORIAL, PR – PRACTICALS, OR – ORAL, TW – TERMWORK.

All Practical, Oral & Term work assessments are to be done as per the prevailing norms for curriculum implementation & assessment.

Course Name : Post Diploma in Computer Applications

Course Code : CA

Semester : Third

Subject Title : Computer Maintenance

Subject Code : 9731

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs.	TH	TEST	PR	OR	TW	TOTAL
04	-	02	3	80	20	-	25@	--	125

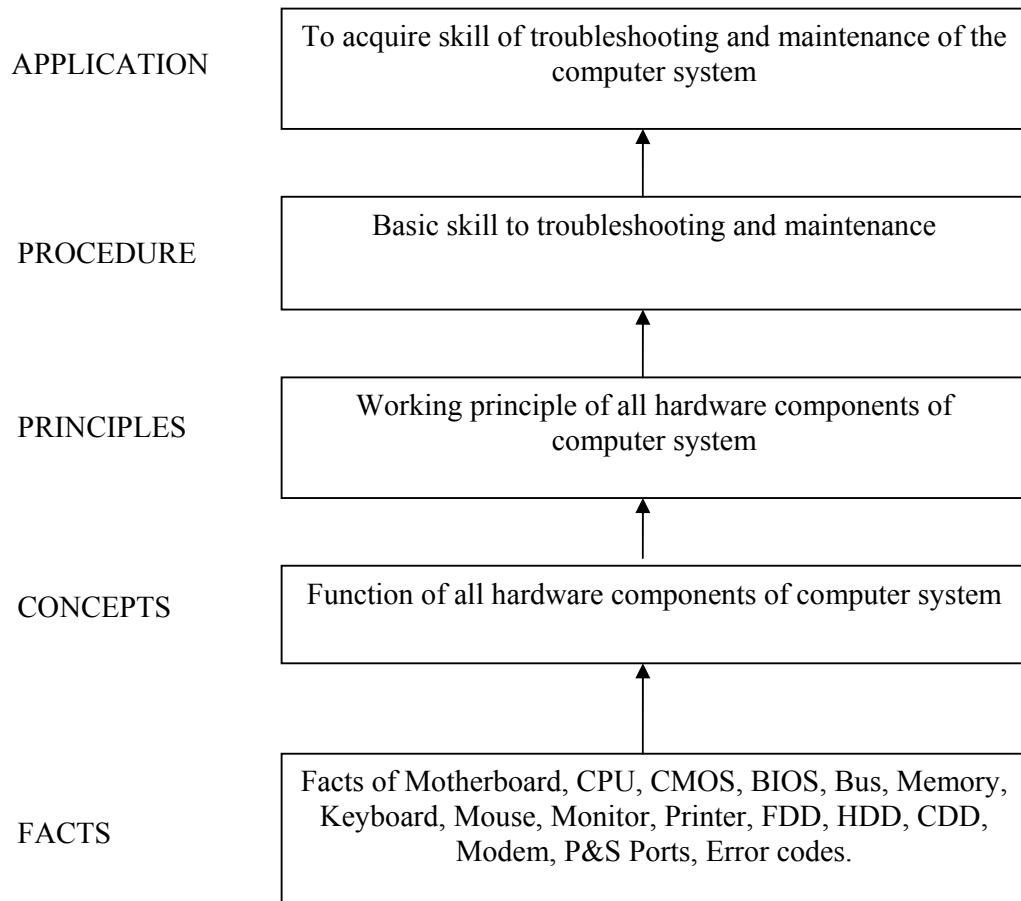
Rationale :

This subject is classified under technology subject group. The study of this subject will make the student to understand the hardware peripherals working principles, assembling steps, troubleshooting and preventive maintenance. It concentrates on the symptoms & problems areas that occur in every areas of the modern computer system, as well as proper diagnosis of the problem.

Objectives :

The use of computer is ever increasing and computer is no longer a luxury. It has become a necessity. With every house owing a computer and every organization possessing hundreds of computers there is a need for support engineers for these computers. This subject deals with the skills required for efficient computer maintenance.

Learning Structure



CONTENTS: Theory

Chapter	Name of the Topic	Marks	Hours
1	The System Unit: 1.1 Motherboard 1.2 Introduction 1.3 Understanding the motherboard socket, socket 8 or slot 1.4 Troubleshooting a motherboard A1 Symptoms related motherboard	04	02
2	Central Processing Unit 2.1 Introduction of CPU, busses, Address modes 2.2 Modem CPU concepts 2.3 CPU Sockets 2.4 CISC, RISC, CPUS 2.5 Pipelining 2.6 Intel CPUs, 8086/8088, 80286, 80386, 80486, Pentium, Pentium II, Pentium III, Pentium IV, Hyper threading, Dual Core 2.7 Troubleshooting related CPUs, 2.8 General symptoms and solutions	04	04
3	CMOS and BIOS 3.1 CMOS 3.1.1 What is CMOS 3.1.2 CMOS MAP 3.1.3 Configuration the CMOS setup 3.1.4 Troubleshooting 3.1.5 CMOS related symptoms 3.1.6 CMOS password troubleshooting 3.2 BIOS 3.2.1 POST setup 3.2.2 BIOS features 3.2.3 BIOS and boot sequence 3.2.4 Troubleshooting BIOS error messages 3.2.5 General BIOS messages 3.2.6 PCI error messages 3.2.7 Updating the BIOS	08	08
4	BUS 4.1 Introduction of BUS 4.2 ISA / EISA bus operation 4.3 General troubleshooting 4.4 MCA bus operation 4.5 General bus operation 4.6 PCI bus operation 4.7 AGP bus 4.8 General bus troubleshooting	04	04
5	MEMORY 5.1 Essential memory concept 5.2 Memory organization 5.3 Troubleshooting 5.4 Memory test equipments 5.5 Repairing SIMM, DIMM, SDRAM, DDR, DDR2	04	04

Chapter	Name of the Topic	Marks	Hours
	sockets 5.6 Contact corrosion 5.7 Parity errors		
6	KEYBOARD and MOUSE 6.1 KEYBOARD 6.1.1 Introduction 6.1.2 Keyboard constructions 6.1.3 Key codes, Keyboard interface 6.1.4 Cord less Keyboard 6.1.5 Keyboard troubleshooting 6.1.6 Keyboard cleaning and maintenance 6.2 MOUSE 6.2.1 Introduction 6.2.2 Mouse construction 6.2.3 Mechanical sensors 6.2.4 Opto-mechanical sensors 6.2.5 Track ball, construction 6.2.6 Scroll Mouse 6.2.7 Optical Mouse 6.2.8 Laser Mouse 6.2.9 Cordless Mouse 6.2.10 Troubleshooting: Mouse tracking interface, Mouse drivers software issues, Symptoms	10	06
7	MONITOR and PRINTER 7.1 MONITOR 7.1.1 Introduction 7.1.2 Monitor specification and characteristics 7.1.3 Troubleshooting a CRT: Inside the CRT, Identifying the CRT problems, Correcting shorts, CRT Test 7.1.4 LCD Monitors: Liquid Crystal Display, Inside LCD, Identifying the LCD problems 7.1.5 Troubleshooting a color monitor: Wrapping it up, Post repair testing and alignment, Symptoms 7.2 PRINTER 7.2.1 Introduction of printer 7.2.2 Types of printer 7.2.3 Troubleshooting of printer	08	08
8	STORAGE DEVICES and EXTERNAL STORAGE DEVICES 8.1 STORAGE DEVICES 8.1.1 Introduction 8.1.2 Magnetic storage concepts 8.1.3 Floppy Drive Construction 8.1.4 Hard Disk Construction 8.1.5 Drive testing and troubleshooting 8.1.6 HDD controller BIOS error codes 8.1.7 Troubleshooting DOS compatibility mode problems 8.1.8 Symptoms and solutions 8.2 EXTERNAL STORAGE DEVICES	12	08

Chapter	Name of the Topic	Marks	Hours
	8.2.1 Introduction 8.2.2 The USB port 8.2.3 Flash Drives 8.2.4 USB Hard Disks 8.2.5 Magnetic Tapes 8.2.6 Installation and Troubleshooting		
9	CD ROM / CD RW / DVDR / DVDRW DRIVE 9.1 Understanding the CD / DVD media 9.2 CD ROM / CD R standard and characteristic 9.3 Construction 9.4 Troubleshooting 9.5 Troubleshooting drives 9.5.1 Recording issues 9.5.2 Typical compatibility issues 9.5.3 Typical compatibility problems 9.5.4 Symptoms	06	04
10	MODEM 10.1 Introduction 10.1.1 Internal & External modem 10.1.2 Basic modem construction and operation 10.1.3 Understanding signal modulation 10.1.4 Signaling standards 10.1.5 Modem troubleshooting 10.2 ADSL Routers 10.2.1 Construction 10.2.2 Configuration 10.2.3 Troubleshooting	04	02
11	PARALLEL PORT, SERIAL PORT, USB and FIREWIRE 11.1 Understanding and configuring ports 11.2 Troubleshooting the ports	04	02
12	PC Cards 12.1 Display Cards 12.2 Network Cards 12.3 Network Cabling 12.4 Installation 12.5 Maintenance 12.6 Troubleshooting	04	04
13	ERROR CODES 13.1 IBM diagnostics codes 13.2 Reading for codes 13.3 Troubleshooting with diagnostic codes 13.4 Beep codes 13.5 BOST codes 13.6 Interpreting the post codes 13.7 Beep /Post troubleshooting	04	04
14	14 Assembling the Computer and preventive maintenance 14.1 Keyboard, Mouse, Hard disk drive, Floppy disk drive, CD-ROM drive, Monitor, Printer	04	04
Total		80	64

Practical:**Skills to be developed:**

Intellectual Skills:

1. Analyse the problem
2. Determine the solution
3. Select proper component for repairs

Motor Skills:

1. Use of proper Hand tools
2. Testing of Components and Circuits
3. Proper fitting of the components

List of Practicals:

1. Study of Motherboard and its different slots
2. Study of Central Processing Unit
3. Configure the CMOS setup
4. Study of BIOS setup
5. Study of ISA/PCI and AGP BUS and rectify its problems
6. Study of Memory and its organization
7. Maintenance of keyboard and various keys
8. To study installation & repairing of 2 / 3 button, Scroll. Optical and Laser Mouse
9. Troubleshooting of CRT and LCD Monitors
10. Study working & maintenance of DOT matrix, Laser, Inkjet, DeskJet & Line Printers and its installation under various OS
11. Installation, Maintenance and cleaning of FDD
12. Maintenance and installation of HDD
13. Installation and maintenance of USB drives
14. Maintenance and installation of CD ROM / CD RW / DVDR / DVDRW drives
15. Maintenance and installation of internal/External modem
16. Installation and configuration of ADSL Routers
17. Study & Configuration of serial & Parallel of port
18. Installing, configuring and troubleshooting different ports
19. Installing and configuring Display and Network Cards
20. Study of Cat-6 Cable, Colour codes and UTP Connectors
21. Study different types of error messages/codes
22. Assembling the computer and installing the OS

Learning Resources:**1. Books:**

Sr. No.	Author	Title	Publisher & Address
1	Stephem J. Bigrow	Computer troubleshooting and maintenance	BPB Publication, New Delhi
2	Brenner R.C.	IBM PC Ad. Troubleshootine	BPB Publication, New Delhi

2. List of Websites :

Sr. No.	Website Address
1	http://www.srikumar.com/personality-development/index.htm
2	http://www.geocities.com/neovedanta/acxxii.html
3	www.intel.com/in
4	en.wikipedia.org/wiki/Liquid_crystal_display
5	en.wikipedia.org/wiki/USB_flash_drive

Course Name : Post Diploma in Computer Applications

Course Code : CA

Semester : Third

Subject Title : Computer Networking

Subject Code : 9732

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs.	TH	TEST	PR	OR	TW	TOTAL
04	-	02	3	80	20	-	25@	--	125

Rationale :

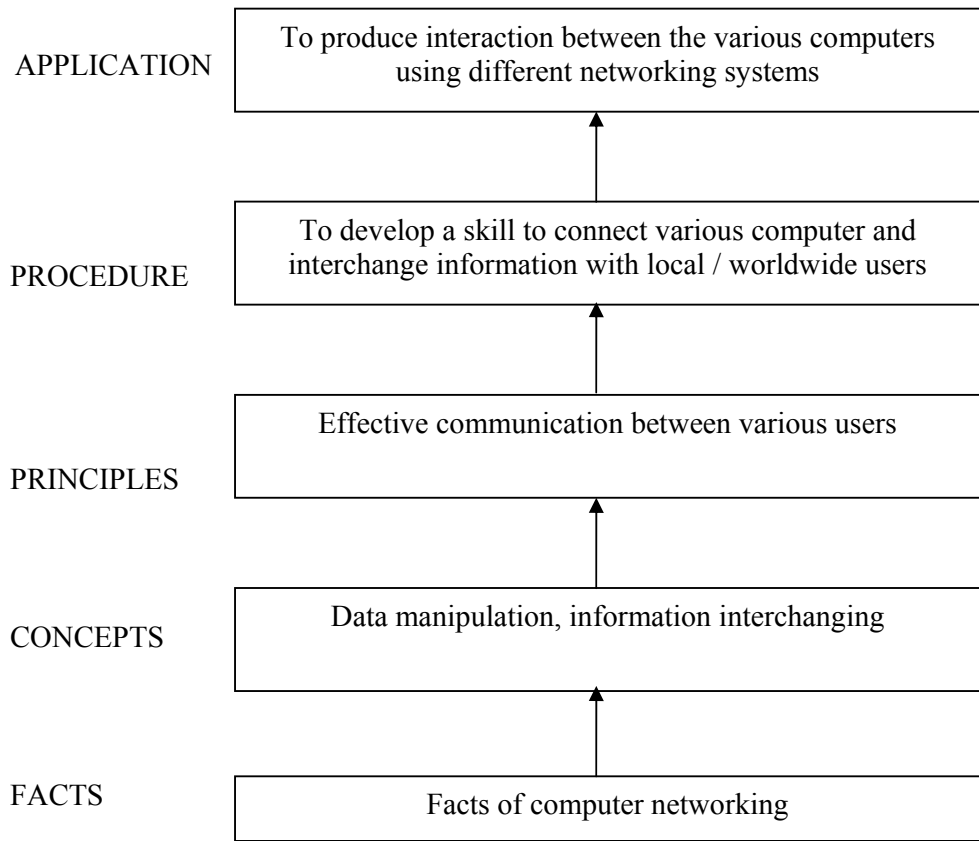
This subject is classified under technology subject group. This is a study of inter connect various computer with each other inside campus area as well as outside of campus using cable or satellite.

The knowledge and skill obtained by the student will be helpful to communicate with worldwide users, which develop personality, communication and decision making skill.

Objectives :

The objective of this subject is to help students build on their networking knowledge and keep them up to date with the new technologies in the ever changing and dynamic world of networking, ultimately preparing them for career in the field of networking.

Learning Structure:



CONTENTS: Theory

Chapter	Name of the Topic	Marks	Hours
1	Networking concepts and components 1.1 Concept of Networking 1.1.1 Network Applications 1.1.2 Network Hardware 1.1.3 Network Software 1.1.4 Models of Network Computing 1.1.5 Centralized, Distributed, Collaborative computing 1.2 Network Services 1.2.1 Authentication servers 1.2.2 Directory services 1.2.3 Dynamic Host Configuration Protocol (DHCP) 1.2.4 DNS 1.2.5 E-mail 1.2.6 Printing 1.2.7 Network file system	12	08
2	Network Strategies and Types of Networks 2.1 Peer-to-peer Networks 2.2 Client-Server Networks 2.3 Application-Server Networks 2.4 Local Area Network 2.5 Metropolitan Area Network 2.6 Wide Area Network 2.7 Internet, Intranet, Extranet 2.8 Network Topology and Architectures 2.8.1 Bus 2.8.2 Ring 2.8.3 Star 2.8.4 Mesh	16	12
3	Communications 3.1 Digital and Analog 3.2 Parallel and Serial Communication 3.3 Synchronous and Asynchronous 3.4 Simplex 3.5 Half Duplex 3.6 Full Duplex 3.7 Multiplexing 3.8 Switching Techniques 3.9 Circuit Switching 3.10 Message Switching 3.11 Packet Switching 3.12 Public telephone networks 3.12.1 Leased line types 3.12.2 Packet Routing services: ISDN and B-ISDN 3.12.3 Frame Relay 3.12.4 Asynchronous satellite Transmission 3.12.5 Microwave Transmission 3.12.6 Optical Fiber transmission	16	16

Chapter	Name of the Topic	Marks	Hours
4	Transport protocols 4.1 Use of TCP/IP, Netware IPX/SPX and NETBEUI 4.2 Transmission Media 4.2.1 Characteristics-Cost-Installation Requirements, Bandwidth, Attenuation, Electromagnetic interfaces, Cable and Fiber optic cable	16	12
5	Connecting Devices, their functions and applications 5.1 Modems 5.2 Repeaters 5.3 Hubs-Active-Passive 5.4 Switch 5.5 Bridges 5.6 Routers 5.7 Gateways	12	08
6	Security and Services 6.1 Concepts, Features, Components, Hardware and Software required, Application security in Intranet. 6.2 Use of Intranet to services like E-mail, WWW, Chat Systems, News, Database Interface.	08	08
	Total	80	64

Practical:

Skills to be developed:

Intellectual skills:

- 1) Understanding of basics concept of network
- 2) Comparison of different network
- 3) Installation of protocols

Motor skills:

- 1) Proper handling of Computer System hardware.

List of Practical:

- 1 Draw layout of LAB Network.
- 2 Use step by step procedure for i.e. File sharing & Printer sharing.
- 3 Compare different Network Topologies.
- 4 Compare Network directing devices:i.e. Hub, Switch, Router.
- 5 Create a Network cable using RJ45 connectors.
- 6 To locate MAC address of computer
- 7 Installation of TCP/IP Protocol i.e. NetBEUI Protocol
- 8 Implementing a TCP/IP Network configuring

Learning Resources:**1. Books :**

Sr. No.	Author	Title	Publisher & Address
1	Andrew S. Tanenbaum	Comp. Network	Prentice Hill India
2	Kelkar A.R.	Linear Network Th.	Pratibha Publication, Nagpur.

2. List of Websites :

Sr. No.	Website Address
01	http://en.wikipedia.org/wiki/Network_File_System
02	http://en.wikipedia.org/wiki/Computer_network
03	http://en.wikipedia.org/wiki/Computer_networking
04	http://www.w3schools.com/tcpip/default.asp
05	http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/netwarep.htm
06	http://en.wikipedia.org/wiki/NetBEUI

Course Name : Post Diploma in Computer Applications

Course Code : CA

Semester : Third

Subject Title : Operating System

Subject Code : 9733

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs.	TH	TEST	PR	OR	TW	TOTAL
04	-	04	3	80	20	50#	-	25@	175

Rationale :

The subject operating system intends to teach the students design and data structures used to develop an operating system. The students will also learn the various services of an operating system, organized in various layers to perform different functions. These basic concepts can be used for a proper understanding of single user and multi-user operating systems.

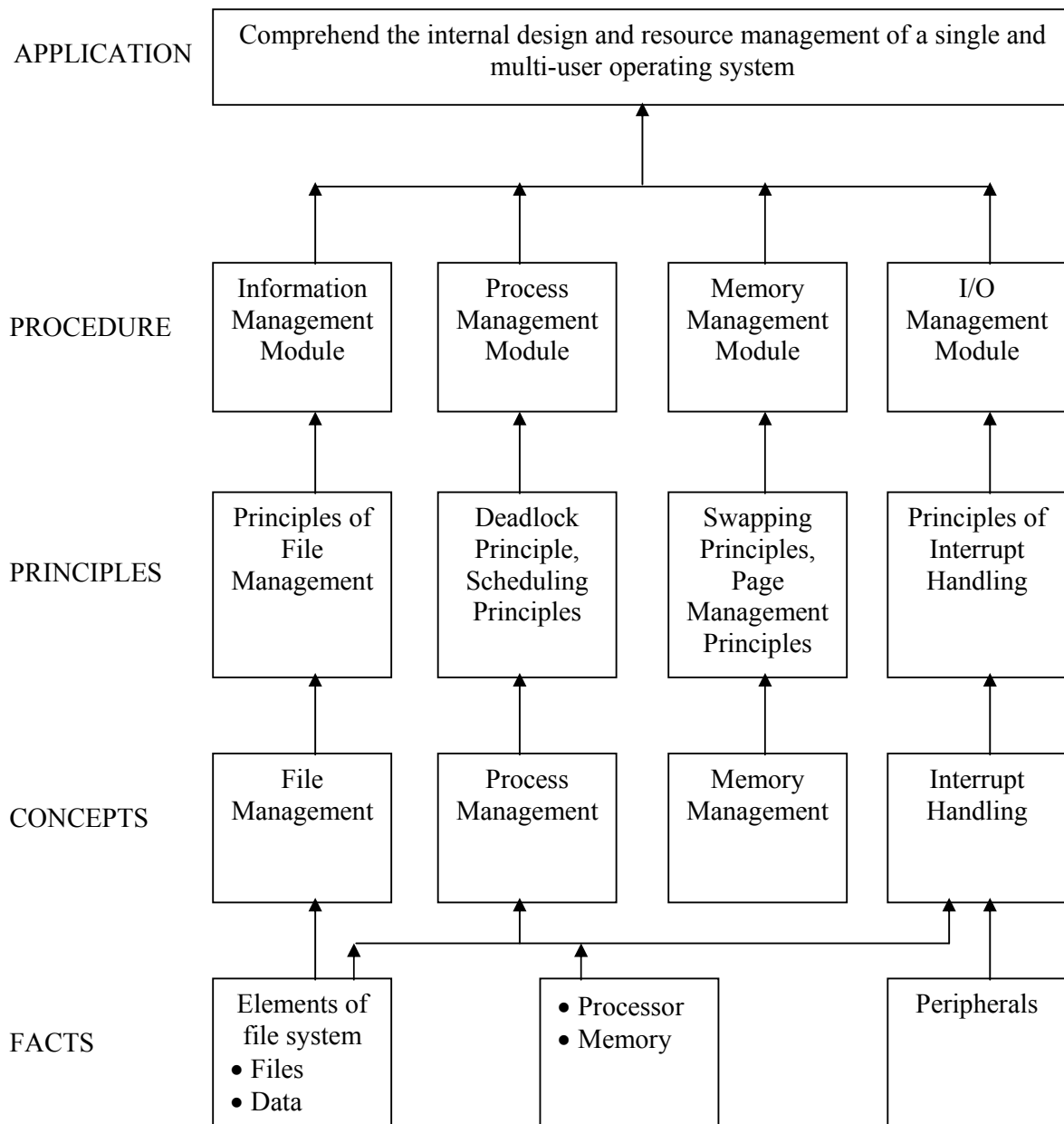
The students will also familiarize themselves with case study on UNIX OS, its design architecture, command structures, utilities and UNIX shell programming features.

Objectives :

On completion of this subject the student should be able to accomplish the following:

1. Understand and evaluate operating system implementations.
2. Develop UNIX system software.

Learning Structure:



CONTENTS: Theory

Chapter	Name of the Topic	Marks	Hours
1	Introduction 1.1 Introduction to an operating system. 1.2 Evolution of operating systems. 1.2.1 Sequential processing. 1.2.2 Multi programming 1.2.3 Real time. 1.2.4 Multi tasking 1.2.5 Multi threading. 1.3 Operating System services	08	06
2	File Systems 2.1 File concept 2.1.1 File types 2.1.2 Disk based systems blocking 2.1.3 File operations 2.1.4 Access methods 2.1.5 Sequential methods 2.1.6 Direct access 2.1.7 Other access 2.2 Free space management methods 2.2.1 Contiguous allocation 2.2.2 Dynamic storage allocation 2.2.3 Linked allocation 2.2.4 Indexed allocation 2.3 File Protection 2.3.1 Naming, Passwords, Access control	10	06
3	Scheduling 3.1 Basic Concept 3.1.1 I/O burst cycle 3.1.2 Scheduling queries 3.1.3 Scheduling preference criteria 3.1.4 First come first served 3.1.5 Shortest job first 3.1.6 Priority 3.1.7 Round Robin	10	06
4	Memory Management 4.1 Basics of Memory Management 4.1.1 Bare machine 4.1.2 Resident monitor 4.1.3 Swapping 4.1.4 Multiple partitions 4.1.5 Paging 4.1.6 Segmentation	10	06
5	Unix Operating System- A Case Study 5.1 History and development of UNIX O.S 5.1.1 Features of UNIX O.S 5.1.2 Structure of UNIX O.S 5.1.3 Kernel, Shell, Applications Utilities. 5.2 UNIX User Interface 5.2.1 Categories of user- Owner, Group, Other	08	08

Chapter	Name of the Topic	Marks	Hours
	5.2.2 Hosts and terminals, users and user accounts, login process		
6	UNIX file management system 6.1 File types: Hierarchical file system 6.1.1 Listing files and directories 6.1.2 Creation of directories, changing, removing directories 6.1.3 Creation of a file and displaying with 'cat', file creation with touch 6.1.4 File attributes with chmod 6.2 Commands 6.2.1 who, who am i 6.2.2 date, cal, tty 6.2.3 sty, pwd, echo 6.2.4 ps 6.2.5 man 6.3 Scheduling Processes 6.3.1 Nice 6.3.2 Wait, sleep, background processing	08	08
7	Useful Unix Commands And Utilities 7.1 File processing commands 7.1.1 Head, tail 7.1.2 Cut, paste join, 7.1.3 Split, 7.1.4 Sort, grep, tr 7.1.5 Comm., cmp, diff, 7.1.6 More, less 7.2 File formatting and printing comands 7.2.1 pr 7.2.2 lp, lpstat commands 7.3 Using pipes and filters (, >, <)	08	08
8	Text Processing In Unix 8.1 Study of vi editor 8.1.1 Features of vi, modes of vi 8.1.2 Creating, editing & saving text 8.1.3 Saving files & quitting vi 8.1.4 Cursor movement and scrolling commands 8.1.5 Text deletion commands 8.1.6 Deleting, copying and yanking, pasting text 8.1.7 Set commands 8.1.8 Abbreviations and map commands 8.2 Introduction to shell script 8.2.1 Writing & executing simple shell script 8.2.2 Expr, echo, test, operators 8.2.3 Quoting 8.2.4 User defined parameters 8.2.5 IF Statements 8.2.6 Looping statement 8.2.7 Case statement	10	08
9	System Administration 9.1 System Administration	08	08

Chapter	Name of the Topic	Marks	Hours
	9.2 Super user concept, role of system administrator		
	9.3 Minimum hardware requirement to set up UNIX OS		
	9.4 System administration commands		
	9.4.1 Creating users		
	9.4.2 Add/remove users		
	9.4.3 Add/remove groups		
	9.4.4 Using devices (like floppy) : mount/umount		
	9.4.5 Backup commands: cpio, tar		
Total		80	64

Practical :

Skills to be developed :

1. Intellectual Skills :

- Understanding concept of Operating System, its functions. Skills in operating with the commands of operating system like UNIX/ Linux. Skill in programming with shell scripts.

2. Motor Skills

- Almost all the commands of UNIX OS are similar to Linux OS. The practicals can be done either on UNIX or LINUX OS.
- Installation of UNIX OS or any flavor of LINUX operating system like RedHat Linux/ Fedora Core/CentOS/SUSE Linux.

List of Practical:

1. Assignment on structure of UNIX O.S
2. Assignment on feature of UNIX O.S.
3. Practical on mkdir, cd, rmdir
4. Practical on cat, touch, cp, mv, rm
5. Practical on chmod
6. Practical who, date, cal, tty, sty, pwd, ps, man
7. Practical on head, tail, cut, paste, join, split
8. Practical on file comparison commands
9. Practical on sort, grep, tr, more, less
10. Study of vi editor
11. Commands A,a,O,o,I,i, file saving commands
12. Cursor movement, text scrolling commands
13. Text deletion, yanking & pasting
14. Set commands, abbreviation & map commands
15. Assignment explaining responsibility of administrator
16. Practical demonstration of system administration commands
17. Practical demonstration on backup commands: cpio & tar

Learning Resources :

1. Books :

Sr. No.	Author	Title	Publisher
1	William Stallings	Operating Systems	Pearson Education
2	Achyut S. Godbole	Operating Systems	TATA McGraw-Hill
3	Pramod Koparkar	UNIX for you	TATA McGraw-Hill
4	Sumitabha Das	UNIX Concepts and Applications	TATA McGraw-Hill

2. List of Websites :

Sr. No.	Website Address
1	http://en.wikipedia.org/wiki/Operating_system
2	http://en.wikipedia.org/wiki/Unix
3	http://www.bell-labs.com/history/unix/tutorial.html
4	http://www.ee.surrey.ac.uk/Teaching/Unix/unixintro.html
5	http://computer.howstuffworks.com/operating-system.htm

Course Name : Post Diploma in Computer Applications

Course Code : CA

Semester : Third

Subject Title : Project and Seminar

Subject Code : --

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs.	TH	TEST	PR	OR	TW	TOTAL
-	-	06	-	-	-	-	50#	50@	100

Rationale :

This subject is classified under technology subject group. Under this, student will design software on actual working data or develop any working model and implement it and under seminar student will directly communicate with other student and show his knowledge.

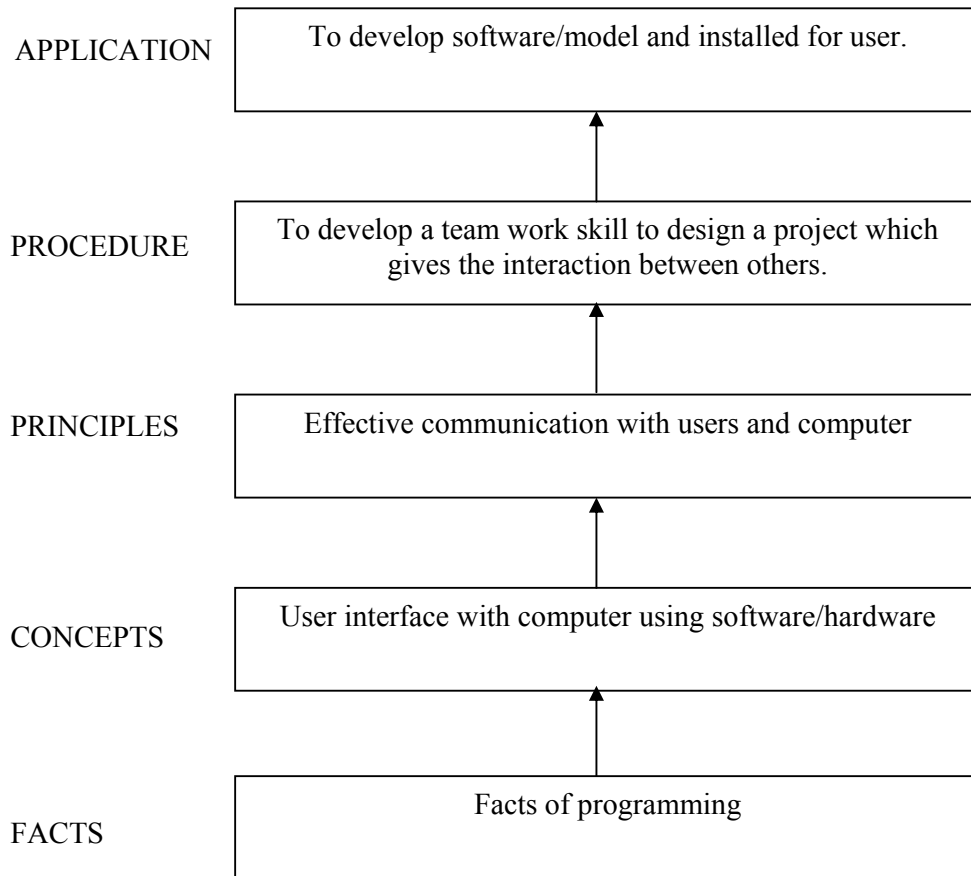
The knowledge and skill obtained by the student will be directly helpful to develop the requirement of industry. It develops the confidence of student to work with live data. Under seminar student will develop skill to participate and communicate his knowledge with others.

Objectives :

The students will be able to,

1. Work in Groups, Plan the work, and Coordinate the work.
2. Develop leadership qualities.
3. Develop Innovative ideas.
4. Practically implement the acquired knowledge.
5. Develop basic technical Skills by hands on experience.
6. Write project report.
7. Develop skills to use latest technology in Computer/Information Technology field.
8. Analyse the different types of Case studies.

Learning Structure:



Guidelines for Project:

1. The concerned teachers are supposed to guide the students for the preparation and presentation of the project report.
2. The project report is to be assessed by external and internal examiners equally for total of 50 marks, which are to be, reported under the title head TW.
3. Preparation of project report should be done by keeping specific views in mind that there should not be any sort of typographical, programmable, diagrammatic and any other mistake/s in the final bound copy submitted by the candidate.

4. Components of Project Report:

1. Introduction
2. Literature review / Survey
3. Problem definition
4. System design
5. Result and future scope
6. Reference

Course Name : Post Diploma in Computer Applications

Course Code : CA

Semester : Third

Subject Title : Professional Practices

Subject Code : --

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs.	TH	TEST	PR	OR	TW	TOTAL
-	-	05	-	-	-	-	-	50@	50

Rationale :

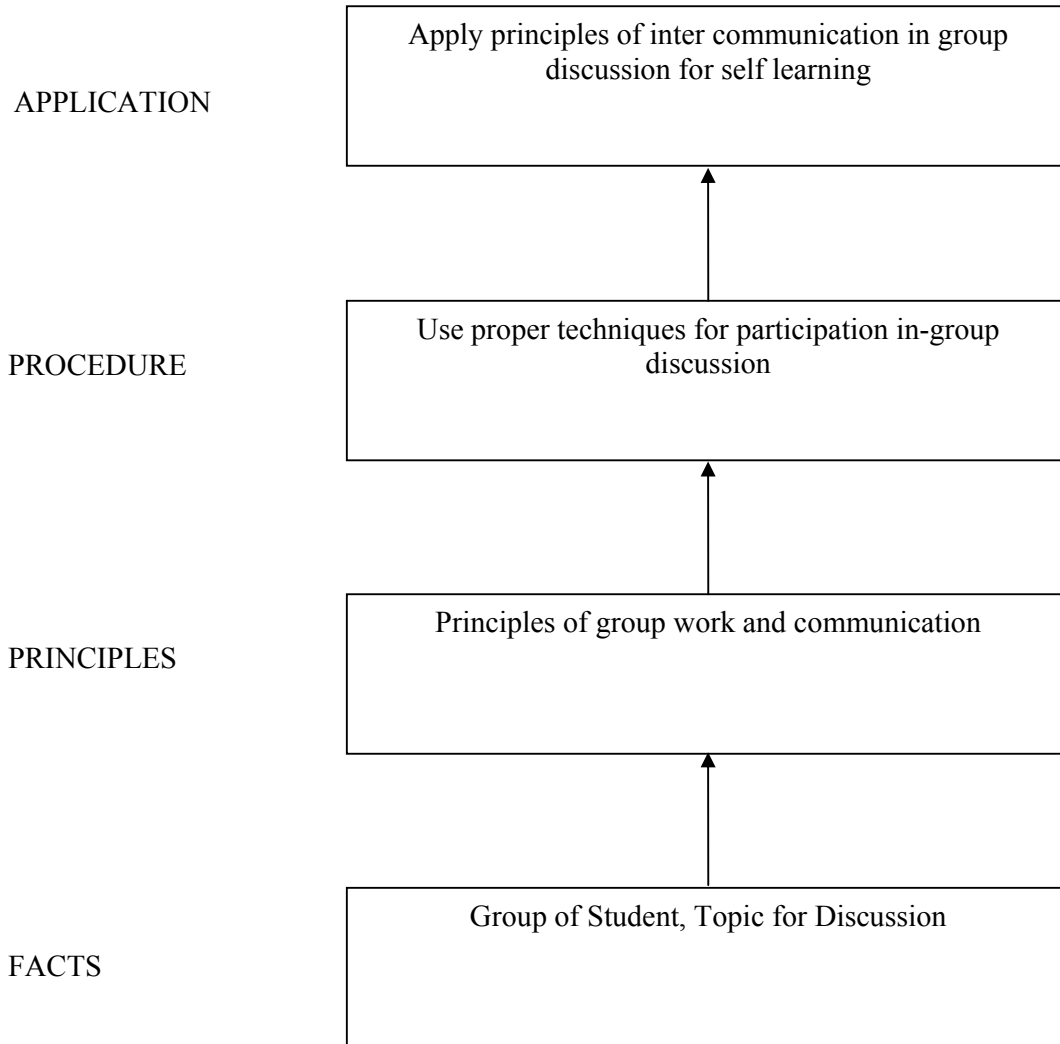
Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

Objectives :

The purpose of introducing professional practices is to provide opportunity to students to undergo activities, which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Learning Structure



Sr. No.	Activity
1	Industrial Visits Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work.
2	The Guest Lecture/s from field/industry experts, professionals to be arranged minimum 3 Lectures each of two hour. The brief report to be submitted on the guest lecture by each student as a part of Term work
3	Information Search (Student seminars based on information search & guest lecture topics.)
4	Group Discussion: The students should discuss in-group of six to eight students and write a brief report on the same as a part of term work. The faculty members may select the topic of group discussions.
5	Seminar: Seminar topic should be related to the subjects of fifth semester / topics from information search & guest lectures. Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time – 10 minutes)