

 MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES																	
COURSE NAME : COMPUTER ENGINEERING GROUP																	
COURSE CODE : CO/CD/CM/CW																	
DURATION OF COURSE : 6 SEMESTERS for CO/CM/CW 8 SEMESTERS for CD												WITH EFFECT FROM 2012-13					
SEMESTER : FOURTH												DURATION : 16 WEEKS					
PATTERN : FULL TIME - SEMESTER												SCHEME : G					
SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (17400)
				TH	TU	PR	PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)			
								Max	Min	Max	Min	Max	Min	Max	Min		
1	Environmental Studies \$	EST	17401	01	--	02	01	50#*	20	--	--	--	--	25@	10	50	
2	Computer Hardware & Maintenance β	CHM	17428	03	--	02	03	100	40	25#	10	--	--	25@	10		
3	Computer Network	CNE	17429	03	--	04	03	100	40	50#	20	--	--	25@	10		
4	Microprocessor and Programming β	MAP	17431	03	--	02	03	100	40	25#	10	--	--	25@	10		
5	Object Oriented Programming β	OOP	17432	03	--	04	03	100	40	50#	20	--	--	25@	10		
6	Computer Graphics	CGR	17056	01	--	02	--	--	--	50#	20	--	--	25@	10		
7	Professional Practices-II β	PPT	17042	--	--	03	--	--	--	--	--	--	--	50@	20		
TOTAL				14	--	19	--	450	--	200	--	--	--	200	--	50	
**	Industrial Training (Optional)			Examination in 5th Semester Professional Practices-III													
<p>Student Contact Hours Per Week: 33 Hrs.</p> <p>THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.</p> <p>Total Marks : 900</p> <p>@ - Internal Assessment, # - External Assessment, No Theory Examination, \$ - Common to all branches, #* - Online Examination, β - Common to IF</p> <p>Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Term Work, SW- Sessional Work.</p> <p>** Industrial Training (Optional) - Student can undergo Industrial Training of four weeks after fourth semester examination during summer vacation.</p> <p>Assessment will be done in Fifth semester under Professional Practices-III. They will be exempted from activities of Professional Practices-III of 5th Semester.</p> <ul style="list-style-type: none"> ➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW). ➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms. ➤ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code. 																	

Course Name : All Branches of Diploma in Engineering & Technology

**Course Code : AE/CE/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/
ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/FG/AU**

Semester : Fourth

Subject Title : Environmental Studies

Subject Code : 17401

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	01	50#*	--	--	25@	75

#* Online Theory Examination

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Environment essentially comprises of our living ambience, which gives us the zest and verve in all our activities. The turn of the twentieth century saw the gradual onset of its degradation by our callous deeds without any concern for the well being of our surrounding we are today facing a grave environmental crisis. The unceasing industrial growth and economic development of the last 300 years or so have resulted in huge ecological problems such as overexploitation of natural resources, degraded land, disappearing forests, endangered species, dangerous toxins, global warming etc.

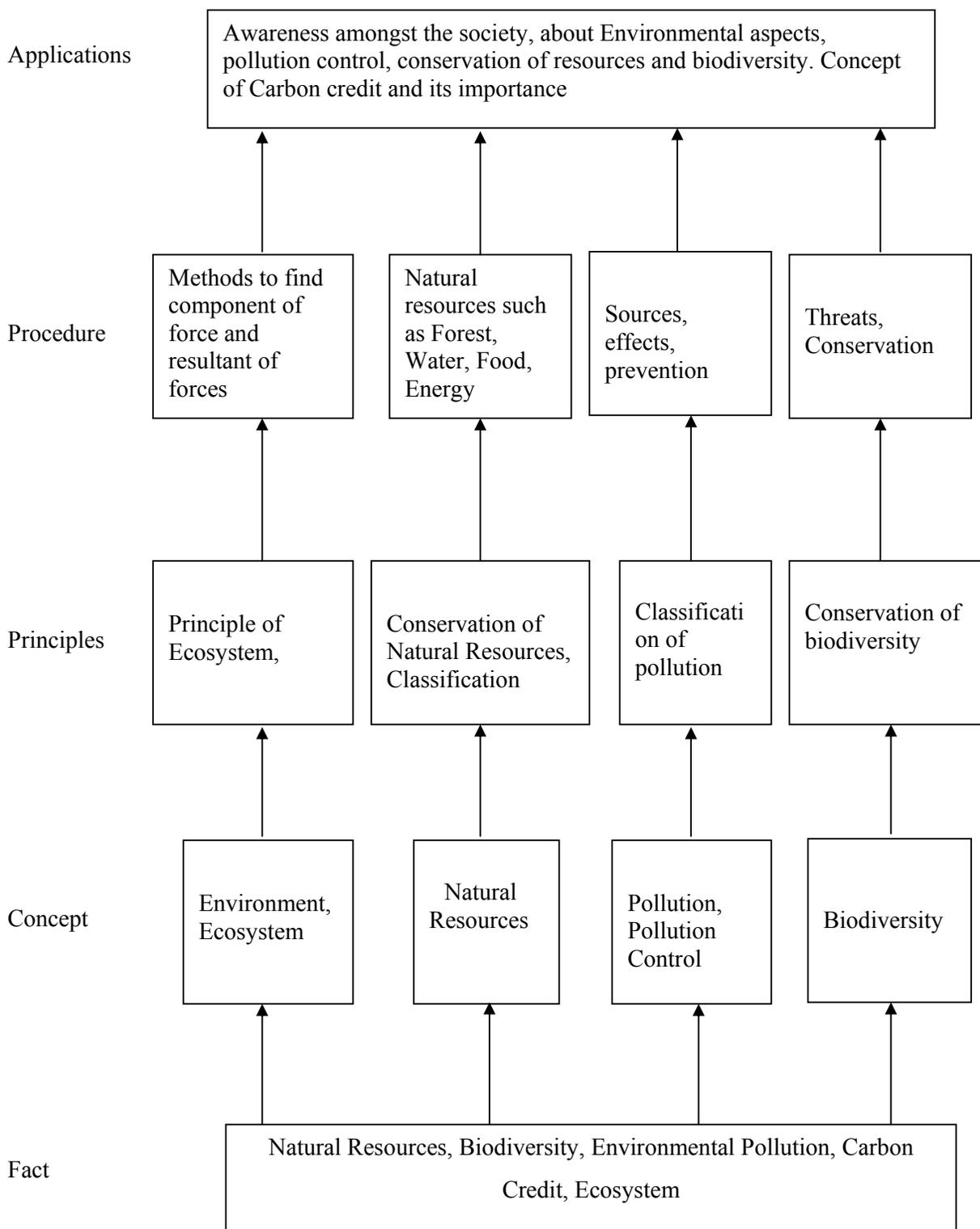
It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

The curriculum covers the aspects about environment such as Environment and Ecology, Environmental impacts on human activities, Water resources and water quality, Mineral resources and mining, Forests, etc.

General Objectives: The student will be able to,

1. Understand importance of environment
2. Know key issues about environment
3. Understands the reasons for environment degradation
4. Know aspects about improvement methods
5. Know initiatives taken by the world bodies to restrict and reduce degradation

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
<p>Topic 1: Nature of Environmental Studies</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Define the terms related to Environmental Studies ➤ State importance of awareness about environment in general public <p>Contents:</p> <ul style="list-style-type: none"> • Definition, Scope and Importance of the environmental studies • Importance of the studies irrespective of course • Need for creating public awareness about environmental issues 	01	04
<p>Topic 2: Natural Resources and Associated Problems</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Define natural resources and identify problems associated with them ➤ Identify uses and their overexploitation ➤ Identify alternate resources and their importance for environment <p>Contents:</p> <p>2.1 Renewable and Non renewable resources</p> <ul style="list-style-type: none"> • Definition • Associated problems <p>2.2 Forest Resources</p> <ul style="list-style-type: none"> • General description of forest resources • Functions and benefits of forest resources • Effects on environment due to deforestation, Timber extraction, Building of dams, waterways etc. <p>2.3 Water Resources</p> <ul style="list-style-type: none"> • Hydrosphere: Different sources of water • Use and overexploitation of surface and ground water • Effect of floods, draught, dams etc. on water resources and community <p>2.4 Mineral Resources:</p> <ul style="list-style-type: none"> • Categories of mineral resources • Basics of mining activities • Mine safety • Effect of mining on environment <p>2.5 Food Resources:</p> <ul style="list-style-type: none"> • Food for all • Effects of modern agriculture • World food problem 	04	10
<p>Topic 3. Ecosystems</p> <ul style="list-style-type: none"> • Concept of Ecosystem • Structure and functions of ecosystem • Energy flow in ecosystem • Major ecosystems in the world 	01	04
<p>Topic 4. Biodiversity and Its Conservation</p> <ul style="list-style-type: none"> • Definition of Biodiversity • Levels of biodiversity 	02	06

<ul style="list-style-type: none"> • Value of biodiversity • Threats to biodiversity • Conservation of biodiversity 		
Topic 5. Environmental Pollution <ul style="list-style-type: none"> • Definition • Air pollution: Definition, Classification, sources, effects, prevention • Water Pollution: Definition, Classification, sources, effects, prevention • Soil Pollution: Definition, sources, effects, prevention • Noise Pollution: Definition, sources, effects, prevention 	03	08
Topic 6. Social Issues and Environment <ul style="list-style-type: none"> • Concept of development, sustainable development • Water conservation, Watershed management, Rain water harvesting: Definition, Methods and Benefits • Climate Change, Global warming, Acid rain, Ozone Layer Depletion, Nuclear Accidents and Holocaust: Basic concepts and their effect on climate • Concept of Carbon Credits and its advantages 	03	10
Topic 7. Environmental Protection Brief description of the following acts and their provisions: <ul style="list-style-type: none"> • Environmental Protection Act • Air (Prevention and Control of Pollution) Act • Water (Prevention and Control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act Population Growth: Aspects, importance and effect on environment <ul style="list-style-type: none"> • Human Health and Human Rights 	02	08
Total	16	50

Practical:**Skills to be developed:****Intellectual Skills:**

1. Collection of information, data
2. Analysis of data
3. Report writing

Motor Skills:

1. Presentation Skills
2. Use of multi media

List of Projects:

Note: Any one project of the following:

1. Visit to a local area to document environmental assets such as river / forest / grassland / hill / mountain
2. Visit to a local polluted site: Urban/Rural/Industrial/Agricultural
3. Study of common plants, insects, birds

4. Study of simple ecosystems of ponds, river, hill slopes etc

Prepare a project report on the findings of the visit illustrating environment related facts, analysis and conclusion. Also suggest remedies to improve environment.

Learning Resources:

Books:

Sr. No.	Author	Title	Publisher
01	Anindita Basak	Environmental Studies	Pearson Education
02	R. Rajgopalan	Environmental Studies from Crises to Cure	Oxford University Press
03	Dr. R. J. Ranjit Daniels, Dr. Jagdish Krishnaswamy	Environmental Studies	Wiley India

Course Name : Computer Engineering Group
Course Code : CO/CD/CM/CW/IF
Semester : Fourth
Subject Title : Computer Hardware & Maintenance
Subject Code : 17428

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	25#	--	25@	150

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

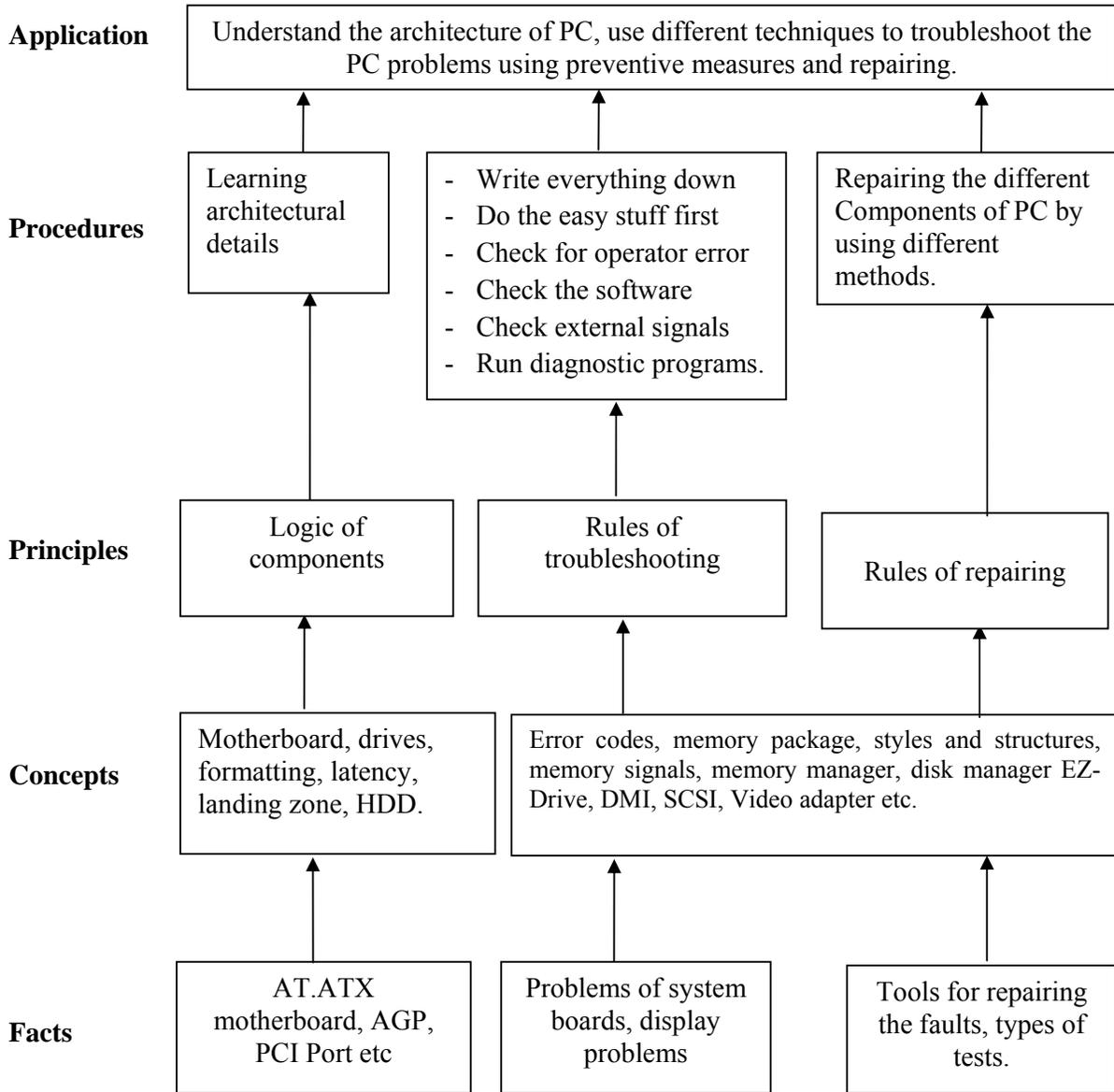
The aim of the subject is to teach the basic working of the computer motherboard, peripherals and add-on cards. The subject helps the students to do the maintenance of the Computer, peripherals and its add-on cards. The students will be able to select the proper peripheral as per their specification and requirement. This is the core technology subject. The pre-requisite of the subject is Microprocessor. The subject is practical oriented and will develop the debugging skills in the students.

Objectives:

The student will be able to:

1. Debug and repair the faults in system.
2. Assemble the system.
3. Load the operating system and device drivers in the system.

Learning Structure:



Theory:

Sr. No	Theory	Hrs.	Marks
1	<p>Motherboard & Its Component Specific Objectives</p> <ul style="list-style-type: none"> ➤ To Understand the various components of Motherboard. ➤ To Know about the different memories in PC & their usage. ➤ To Understand the selection of different components of PC. <p>1.1 CPU – Concept like address lines, data lines, internal registers. 1.2 Modes of operation of CPU – Real mode, IA-32 mode, IA-32 Virtual Real Mode. 1.3 Process Technologies, Dual Independent Bus Architecture, Hyper Threading Technologies & its requirement. 1.4 Processor socket & slots. 1.5 Chipset basic, chipset Architecture, North / South bridge & Hub Architecture. 1.6 Latest chipset for PC 1.7 Overview & features of PCI, PCI –X, PCI express, AGP bus. 1.8 Logical memory organization conventional memory, extended memory, expanded memory. 1.9 Overview & features of SDRAM, DDR, DDR2, DDR3. 1.10 Concept of Cache memory: 1.11 L1 Cache, L2 Cache, L3 Cache, Cache Hit & Cache Miss. 1.13 BIOS – Basics & CMOS Set Up. 1.14 Motherboard Selection Criteria.</p>	12	20
2	<p>Storage Devices & Interfacing. Objective</p> <ul style="list-style-type: none"> ➤ To understand the Recording techniques in storage devices. ➤ To understand the working of storage devices. <p>2.1 Recording Techniques: FM, MFM , RLL, perpendicular recording 2.2 Hard Disk construction and working. 2.3 Terms related to Hard Disk. Track, sector, cylinder, cluster, landing zone, MBR, zone recording, write pre-compensation. 2.4 Formatting: Low level, High level & partitioning. 2.5 FAT Basics: Introduction to file system, FAT 16, FAT 32, NTFS, 2.6 Hard Disk Interface: Features of IDE, SCSI, PATA, SATA, Cables & Jumpers. 2.7 CD ROM Drive: Construction, recording.(Block diagram) 2.8 DVD: Construction, Recording. (Block Diagram) 2.9 Blue-ray Disc specification.</p>	08	20

3	<p>Display Devices & Interfacing Objective</p> <ul style="list-style-type: none"> ➤ To understand the construction and working of display devices like CRT, LCD. ➤ To understand the Interfacing of above devices to PC. <p>3.1 CRT: - Block diagram & working of monochrome & colour Monitor 3.2 Characteristics of CRT Monitor :- DOT Pitch, Resolution, Horizontal Scanning frequency, Vertical scanning frequency, Interlaced Scanning, Non-Interfaced scanning, Aspect ratio. 3.3 LCD Monitor: - Functional Block Diagram of LCD monitor, working principle, Passive matrix, Active matrix LCD display. 3.4 Touch Screen Display – The construction and working principle 3.4 Plasma Display Technology: - Construction & working principle. 3.5 Basic Block Diagram of Video Accelerator card</p>	06	12
4	<p>Input and Output Devices Objective</p> <ul style="list-style-type: none"> ➤ To understand the construction and working of Input /Output Devices. ➤ To understand the Interfacing of the above peripherals. <p>4.1 Keyboard: Types of key switches: Membrane, Mechanical, Rubber dome, Capacitive, optoelectronic and interfacing. 4.2 Mouse: Opto-mechanical, optical (New design) 4.3 Scanner: Flat Bed, Sheet-fed, Handheld: Block diagram of flat Bed and specifications, OCR, TWAIN, Resolution, Interpolation. 4.4 Modem: Internal and External: Block diagram and specifications. 4.5 Printer: Printer Characteristics, Dot matrix, Inkjet, Laser: block diagram and specifications.</p>	06	16
5	<p>Power Supplies Objective</p> <ul style="list-style-type: none"> ➤ To understand the working of SMPS. ➤ To understand the power problems. <p>5.1 Block diagram and working of SMPS. 5.2 Signal description and pin-out diagram of AT and ATX connectors 5.3 Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation. 5.4 Power problems: Blackout, Brownout, surges and spikes. 5.5 Symptoms of power problems. 5.6 Protection devices: circuit breaker, surge suppressor. 5.7 Uninterrupted Power Supply, Online and OFFline UPS, working of UPS: Block diagram, advantages and disadvantages, Ratings</p>	04	12
6	<p>Interfaces Objective</p> <ul style="list-style-type: none"> ➤ To understand the ports of PC. ➤ To understand interfacing techniques of devices to ports <p>6.1 SCSI, SCSI cables and connectors, SCSI drive configuration. 6.2 USB features. 6.3 RS 232 : (Voltages and 9 pin description) 6.4 Centronics (interface diagram, important signals and timing waveform) 6.5 Firewire features 6.6 Blue tooth</p>	06	12

7	PC Troubleshooting, Maintenance and Tools.	06	08
	Objective		
	➤ To understand the preventive maintenance of PC		
	➤ To understand the diagnostic tools of PC		
	7.1 POST: POST sequence, Beep codes, visual display codes.		
7.2 Preventive maintenance: Active, Passive, periodic maintenance procedure.			
7.3 Diagnostic Tools: logic Analyzer, logic probe.			
7.4 Diagnostic software for trouble shooting PC. BGA workstation and its applications for reballing of north bridge and south bridge			
Total		48	100

PRACTICAL:

Skills to be developed:

Intellectual Skills:

- Understanding basic hardware of computer
- Fault finding of input/output devices.
- Troubleshooting of input/output devices
- Proper connection of input/output devices.

Motor Skills:

- Proper handling of Computer System Hardware.

List of Practical:

01. Identify and draw the motherboard layout of Intel i3 processor and understand connection and layout of the H67 or P67 chipset.
02. Perform Basic Input/output System (BIOS) setting and configuration setup using Complementary Metal Oxide Semiconductor (CMOS).
03. Format, partition and install a Hard Disk Drive (HDD) and format a pen drive.
04. Understand layout, characteristics and functions of different components of Hard Disk Drive (HDD) as a storage device.
05. Install Video Graphics Array (VGA) or Super Video Graphics Array (SVGA) display cards.
06. Install and understand the working of printer.
07. Install and understand the working of Input/output devices such as scanner and modem.
08. Connect Switched Mode Power Supply (SMPS) and identify different parts of SMPS. Understand the working of SMPS and Uninterrupted Power Supply (UPS).
09. Use diagnostic software to identify installed computer peripherals and test their working condition.
10. Find faults related to Monitor, CPU, Hard disk, Printer and other peripherals.
11. Form a pico net using Bluetooth devices and transfer data.
12. Assemble PC and install an operating system.

Learning Resources:**Books:**

Sr. No.	Author	Title	Publisher
01	Scott Muller	Upgrading & Repairing PCs	Pearson
02	Mark Minasi	The Complete PC Upgrade & Maintenance guide	Wiley India
03	Barry Press and Maricia Press	PC Upgrade and Repair	Wiley India
04	Begelow	Bigelow's Troubleshooting, Maintaining & Repairing PCs	Tata McGraw Hill
05	Mike Meyers Scott Jernigan	Managing & Troubleshooting PCs	Tata McGraw Hill
06	D.Balasubramanian	Computer Installation & Servicing	Tata McGraw Hill

Course Name : Computer Engineering Group

Course Code : CO/CD/CM/CW

Semester : Fourth

Subject Title : Computer Network

Subject Code : 17429

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

The world in the information era has become network centric. A Computer networks has been growing with rapid technological progress. Computer communication through networking becomes essential part of our life. We can manage many application like Air Line Reservation, Railway Reservation, E-banking, E-Governance, On-Line shopping, E-learning etc. by clicking mouse button from our own place. Because of this, world become the global village. By considering importance of networking towards all aspects of our life, we here introduce basic concept of networks, network classification, network topologies, network devices, Transmission media, Network reference models, concept of TCP/IP.

This knowledge explores the student for understanding current network management technology.

Objectives:

To develop following skills:

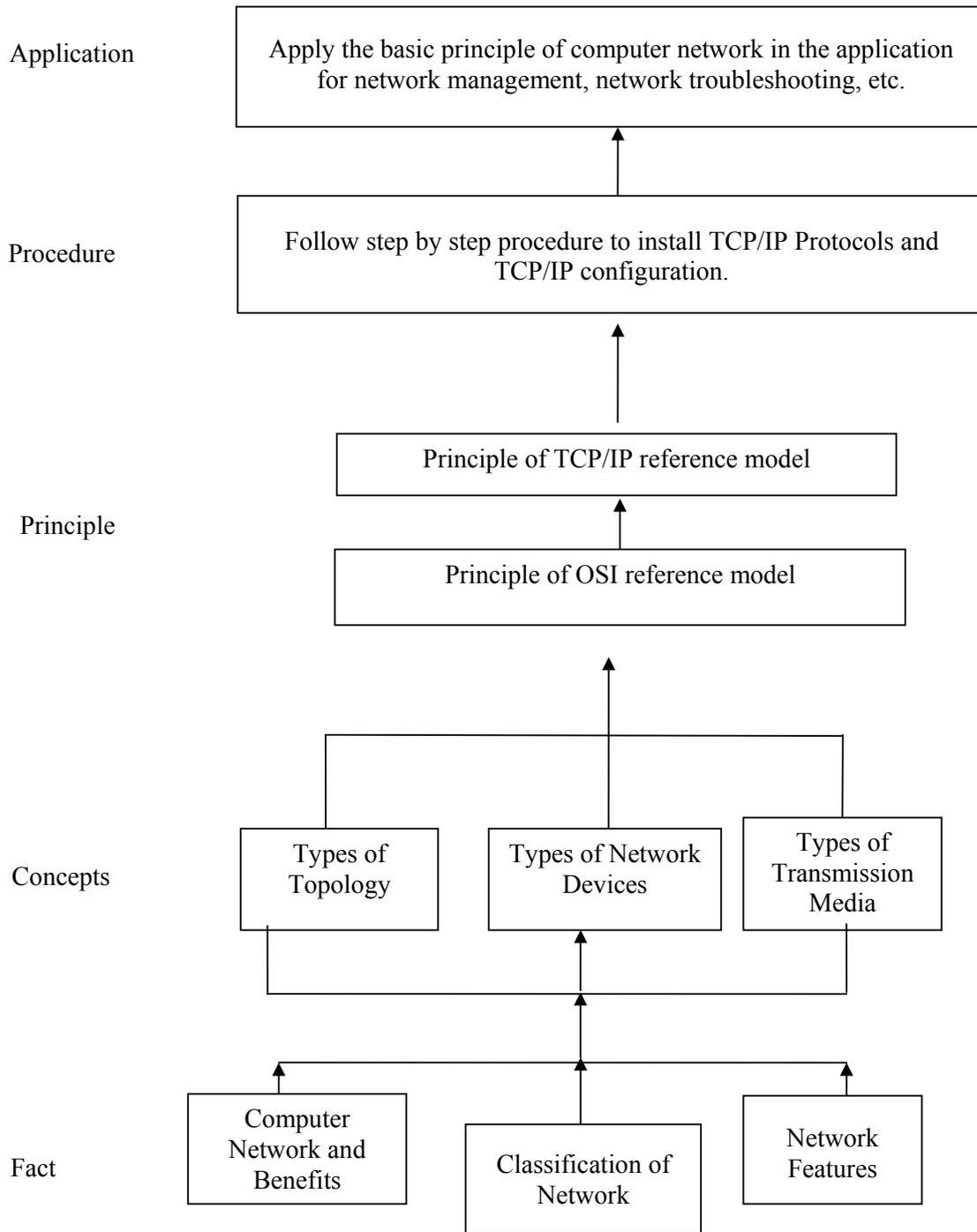
Intellectual Skills:

- Understand network & can identifying benefits of networks.
- Understand and describe communication media.
- Compare different types of Topology.
- Compare different types of network devices.
- Compare OSI and TCP/IP protocol suite.
- Configuration of TCP/IP

Motor Skills:

1. Able to handle Computer Network.
2. To develop a small Computer Network.

Learning Structure:



Contents: Theory

Topic	Content	Hours	Marks
1	<p>BASIC NETWORK CONCEPTS</p> <p>Objectives:-</p> <ul style="list-style-type: none"> ➤ Basic Concept of Network. ➤ Classification of Network. ➤ Benefits of Network. <p>1.1 Fundamentals of Computer Network- Definition Need of Computer Network, Applications, Component of Computer Network.</p> <p>1.2 Network Benefits- Sharing Information(File Sharing, E-mail) - Sharing Resources (Printer Sharing, Application Services) - Facilitating Centralized Management-Managing Software, Maintaining the Network, Backing up data</p> <p>1.3 Computer Network Classifications- Classification of Network by their Geography.-PAN, CAN, LAN, MAN, WAN</p> <p>1.4 Classification of Network by their Component Role--Peer-to-Peer Network, Server-Based Network, Types of server</p>	08	20
2	<p>NETWORK TOPOLOGIES AND NETWORKING DEVICES</p> <p>Objectives:-</p> <ul style="list-style-type: none"> ➤ Topology Concepts. ➤ Different types of Topology. ➤ Network Control Devices. <p>2.1 Network Topologies - Introduction, Definition, Selection Criteria, Types of Topology- i) Bus ii) Ring iii) Star iv) Mesh v) Tree vi) Hybrid.</p> <p>2.2 Network Control / Connecting Devices - Need of Network Control devices, Role of Network Control devices in a Network, Connectors, Hub, Repeater, Bridges, Switches, Router, Gateway, Modem.</p> <p>2.3 Network software: NIC Device Driver, client-server software eg. telnet, ftp</p>	10	20
3	<p>TRANSMISSION MEDIA</p> <p>Objectives:-</p> <ul style="list-style-type: none"> ➤ Concept of Guided and Unguided Transmission Media. ➤ Types of Guided Media. ➤ Types of Unguided Media. <p>3.1 Introduction - Need of Transmission Media, Selection Criteria.</p> <p>3.2 Types of Transmission Media- 1) Guided Media: Cable Characteristics, Types of Cable-Twisted Pair Cable, Co-axial Cable, Fiber Optic Cable. 2) Unguided media: Types of Communication Band-Microwave Communication, Radio wave Communication, Satellite Communication, Infrared Communication.</p> <p>3.3 Latest Technologies in Wireless Network-Bluetooth Architecture, Wi-Fi, Wi- Max.</p> <p>3.4 Cellular (Mobile) Telephone - Band in Cellular Telephony, Calls using Mobile Phones, Transmitting receiving / Handoff operations.</p>	10	20

4	OSI Reference Model Objectives:- <ul style="list-style-type: none"> ➤ Concept of Reference Model. ➤ OSI Reference Model Concept. ➤ Layers of OSI Reference Model. 4.1 Introduction– Layered Architecture , Peer-to- Peer Processes- Interfaces between Layer, Protocols, Organization of the Layers, Encapsulation. 4.2 Layers of the OSI Reference Model (Functions of each Layer & Protocols used) – Physical Layer, Data-Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer.	08	18
5	TCP / IP SUITE Objectives:- <ul style="list-style-type: none"> ➤ TCP/ IP Model Concept. ➤ Defining/functioning of different Layers of TCP / IP suite. 5.1 Introduction –Addressing mechanism in the Internet 5.2 IP Addressing – IP Address classes, classless IP addressing, Subnetting, supernetting, Masking, 5.3 Layered Structure of the TCP / IP Model – Host-to-Network, Internet, Transport, Application 5.4 TCP / IP Protocol Suite : Host-to-Network-SLIP and PPP, Internet Layer-ARP,RARP and IP: Introduction, IPv4, IPv6 (Header Format), Difference between IPv4 & IPv6. Transport Layer- TCP and UDP (Frame Format,port addresses), Application Layer- FTP, SMTP, DNS. 5.5 Comparison between OSI and TCP / IP Network Model.	12	22
Total		48	100

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	To observe Components of Network in your Computer Network Lab. (To know your Network Lab.)	04
2	To understand network features	04
3	To connect and understand different Transmission Media and Network Control devices.	04
4	To Prepare a Straight Cable and Network Cross over Cable and test by Line Tester.	04
5	To install a network interface card	04
6	To Connect Computers in Star Topology using Wired Media and any Network control Device.	06
7	To connect two hubs/switch by creating crossover connection	04
8	To Configure Peer-to-Peer Network.	06
9	To Share Printer and Folder in Network.	04
10	To Install TCP/IP Protocols (Version 4 and version 6) and configure advanced features of TCP/IP Protocols.	04

11	Install Wireshark software to capture packet and Configure it to capture Ethernet packet. Verify Ethernet frame structure and its 48 bit address.	06
12	To Run Basic TCP/IP Utilities and Network Commands with all options.(Ping, Ping ::1, ipconfig, Tracert, Netstat, Wireshark, ARP, NBTSTAT.EXE, WINIPCFG.EXE),capture TCP, UDP,IP, ARP, ICMP, Telnet, FTP packets using Wireshark packet sniffer software	06
13	To understand Subnet Masking and create two subnets	04
14	To visit server room and prepare report on 1. Proxy Server 2. Server Configuration 3. Router Configuration 4. Firewall Configuration 5. Network setup details (Topology, Back up, IP range, network software, UPS)	04
TOTAL		64

Learning Resources:**Books:**

Sr. No.	Title	Author	Publisher
1	Data Communications and Networks	Achyut S. Godbole	Tata McGraw Hill
2	Data Communications and Networking (Forth Edition)	Behrouz A. Forouzan	Tata McGraw Hill
3	Complete Reference Networking	Craig Zacker	Tata McGraw Hill
4	Computer Networking	Tularam M Bansod	Dreamtech Press
5	Networking + Certification (Second Edition)	Microsoft Press	PHI(Prentice-Hall of India Private Limited)

Course Name : Computer Engineering Group

Course Code : CO/CD/CM/CW/IF

Semester : Fourth

Subject Title : Microprocessor and Programming

Subject Code : 17431

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	25#	--	25@	150

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Microprocessor is brain of computer. Intel family is widely used all over the world. 8085 is the 8-bit CPU and 8086 is the 16-bit CPU. 8086 is the base of all upward developed processors. It is more powerful and efficient computing machine. It overcomes all major limitations of the previous processors. It is able to get interfaced with 8-bit, 16-bit systems. IBM PC is introduced in 1980 with 10MB hard disk, one double side double density floppy disk drive, KBD, monitor and asynchronous communications adapter.

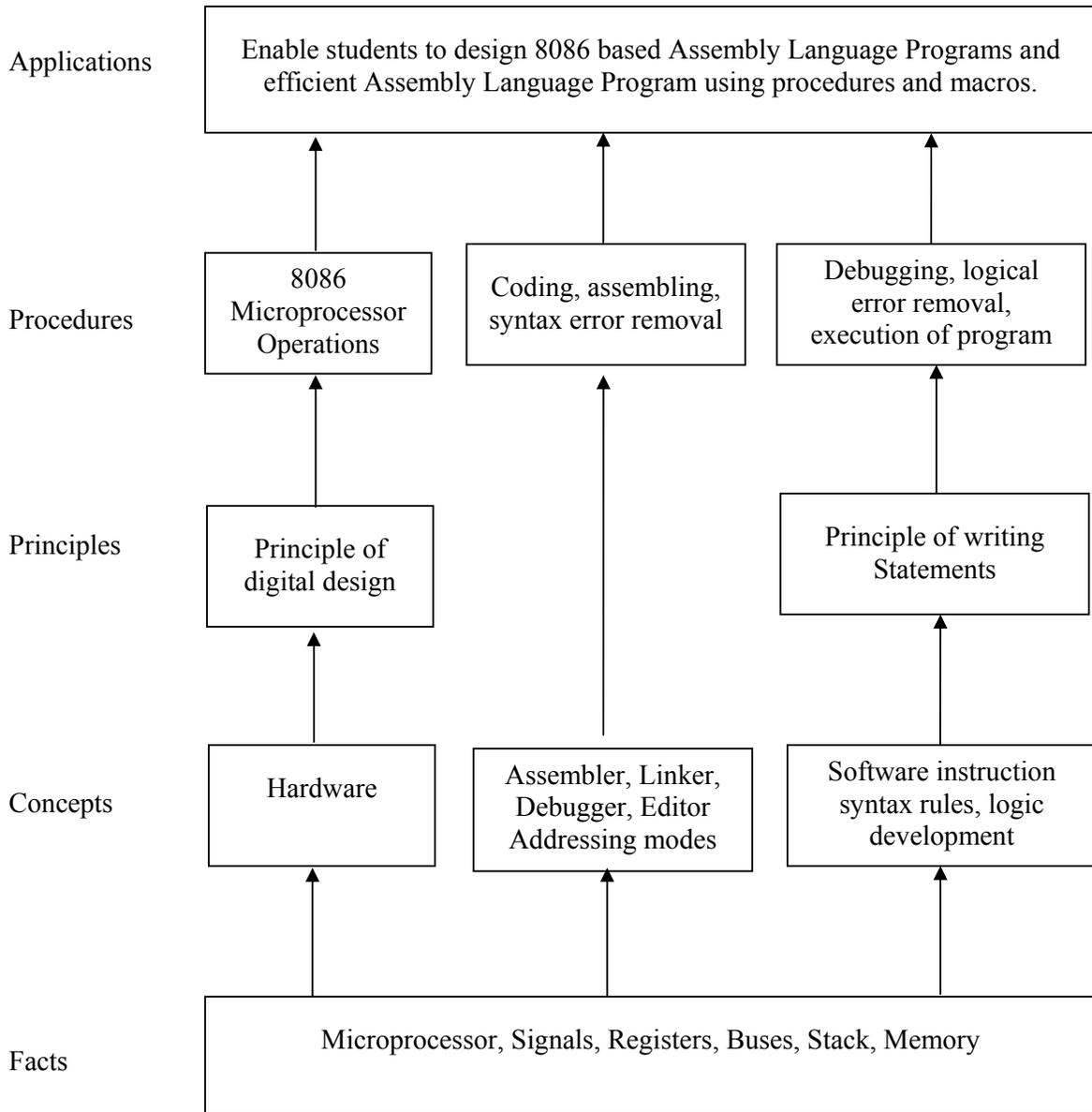
This subject covers Basics of 8085, architecture of 8086 along instruction set. It also covers assembly language programming with effective use of procedure and macros. This will act as base for the advanced assembly language programming for next generation microprocessors.

General objectives:

Students will be able to:

1. Understand the execution of instructions in pipelining and address generation.
2. Write syntax of given instructions.
3. Apply instructions in Assembly Language Program for different problem statements.
4. Use the procedures and macros in assembly language programming.

Learning Structure:



Theory

Name of Topics	Hours	Marks
<p>Topic 1: Basics of Microprocessor Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Draw the architecture of 8085 ➤ Define the functions of different pins of 8085 ➤ Identify status of different flags <p>1.1 Evolution of Microprocessor and types 1.2 8085 Microprocessor,</p> <ul style="list-style-type: none"> • Salient features • Pin description, • Architecture of 8085 - Functional Block diagram, • Register organization, 	04	08
<p>Topic 2 :16 Bit Microprocessor: 8086 Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Define the functions of different pins ➤ Draw functional block diagram of 8086 ➤ Understand the operating modes of 8086 <p>2.1 8086 Microprocessor,</p> <ul style="list-style-type: none"> • Salient features • Pin descriptions • Architecture of 8086 - Functional Block diagram • Register organization, • Concepts of pipelining, • Memory segmentation • Physical memory addresses generation. <p>2.2 Operating Modes of 8086</p> <ul style="list-style-type: none"> • 8284 Clock Generator • 8288 Bus Controller • 74LS245 Bi-directional Buffer • 74LS373 Octal Latch • Minimum Mode operation and its timing diagram • Maximum Mode operation and its timing diagram 	12	24
<p>Topic 3 : Instruction Set of 8086 Microprocessor Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Understand the different types of instructions ➤ Identify the addressing modes of instructions ➤ State the operation of an instructions <p>3.1 Machine Language Instruction format, addressing modes 3.2 Instruction set, Groups of Instructions</p> <ul style="list-style-type: none"> • Arithmetic Instructions • Logical Instructions • Data transfer instructions • Bit manipulation instructions • String Operation Instructions, • Program control transfer or branching Instructions • Process control Instructions 	10	20
Topic 4 :The Art of Assembly Language Programming	04	08

<p>Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Know the program development steps ➤ Use the different program development tools ➤ Illustrate the functions of assembler directive and operators <p>4.1 Program development steps</p> <ul style="list-style-type: none"> • Defining problem, • Writing Algorithms • Flowchart • Initialization checklist • Choosing instructions • Converting algorithms to assembly language programs. <p>4.2 Assembly Language Programming Tools</p> <ul style="list-style-type: none"> • Editors • Assembler • Linker • Debugger. <p>4.3 Assembler directives and Operators</p>		
<p>Topic 5: 8086 Assembly Language Programming.</p> <p>Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Write a appropriate programs using editor ➤ Run program using assembler and linker ➤ Debug program using debugger <p>5.1 Model of 8086 assembly language programs</p> <p>5.2 Programming using assembler -</p> <ul style="list-style-type: none"> • Arithmetic operations on Hex and BCD numbers - Addition, Subtraction, Multiplication and Division • Sum of Series • Smallest and Largest numbers from array • Sorting numbers in Ascending and Descending order • Finding ODD/EVEN numbers in the array • Finding Positive and Negative Numbers in array • Block transfer • String Operations - Length, Reverse, Compare, Concatenation, Copy • Count Numbers of '1' and '0' in 8/16 bit number • BCD to Hex and Hex to BCD number conversion 	12	24
<p>Topic 6 : Procedure and Macro in Assembly Language Program</p> <p>Specific Objective: Students will be able to</p> <ul style="list-style-type: none"> ➤ Understand the purpose of procedure and macros ➤ Use procedure and macros <p>6.1 Procedure</p> <ul style="list-style-type: none"> • Defining Procedure - Directives used, FAR and NEAR • CALL and RET instructions. • Reentrant and Recursive procedures. • Assembly Language Programs using Procedure <p>6.2 Defining Macros.</p> <ul style="list-style-type: none"> • Assembly Language Programs using Macros. 	06	16
Total	48	100

Skills to be developed:**Intellectual skills:**

- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as
 - Problem definition
 - Analysis
 - Design of logic
 - Coding
 - Testing
 - Maintenance (Modifications, error corrections, making changes etc.)

Motor Skills:

- Proper handling of Computer System.

Practicals:**List of Practical:**

1. Identify the Assembly Language programming tools like Assembler, linker, debugger, editor.
2. Write an Assembly Language Program to add / subtract two 16 bit numbers.
3. Write an ALP to find sum of series of numbers.
4. Write an ALP to multiply two 16 bit unsigned/ signed numbers.
5. Write an ALP to divide two unsigned/ signed numbers (32/16 , 16/8, 16/16, 8/8)
6. Write an ALP to add / Sub / multiply / Divide two BCD numbers.
7. Write an ALP to find smallest/ largest number from array of n numbers.
8. Write an ALP to arrange numbers in array in ascending/ descending order.
9. Write an ALP to perform block transfer data using string instructions / without using string instructions.
10. Write an ALP to compare two strings using string instructions / without using string instructions.
11. Write an ALP to display string in reverse order, string length, Concatenation of two strings.
12. Write an ALP to convert Hex to Decimal, Decimal to Hex.

Learning Resources**1. Books**

Sr. No.	Name of Book	Author	Publication
1.	Microprocessor & interfacing (programming & hardware) Revised Second Edition	Douglas V. Hall	Tata McGraw Hill

2.	Microprocessor Architecture, Programming and Applications with the 8085	Ramesh S. Gaonkar	Penram International Publishing (India)
3.	The 8088 and 8086 Microprocessors	Walter A. Triebel, Avtar Singh	Pearson Publications
4.	The 8086.8088 Family, Design, Programming, and Interfacing	John Uffenback	PHI

2. Websites:

www.intel.com

www.pcguides.com/ref/CPU

www.CPU-World.com/Arch/

www.techsource.com/engineering-parts/microprocessor.html

Course Name : Computer Engineering Group
Course Code : CO/CD/CM/CW/IF
Semester : Fourth
Subject Title : Object Oriented Programming
Subject Code : 17432

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

The ability to organize & process information is key to success in modern age. Object Oriented Programming has become the most preferred approach for software projects. It offers a new and powerful way to cope up with complexity of real world problems. Among the OOP languages available, C++ is one of the most widely used language.

Instead of viewing program as a series of steps to be carried out, OOP approach views it as a group of objects that have certain properties & can take appropriate actions.

Object Oriented Concepts like inheritance, polymorphism, data abstraction and encapsulation etc. requires knowledge of C++, which also acting as base for programming languages like Java, Object Oriented Modeling & Designing (OOMD), VC++.

Objectives:

To develop following skills:

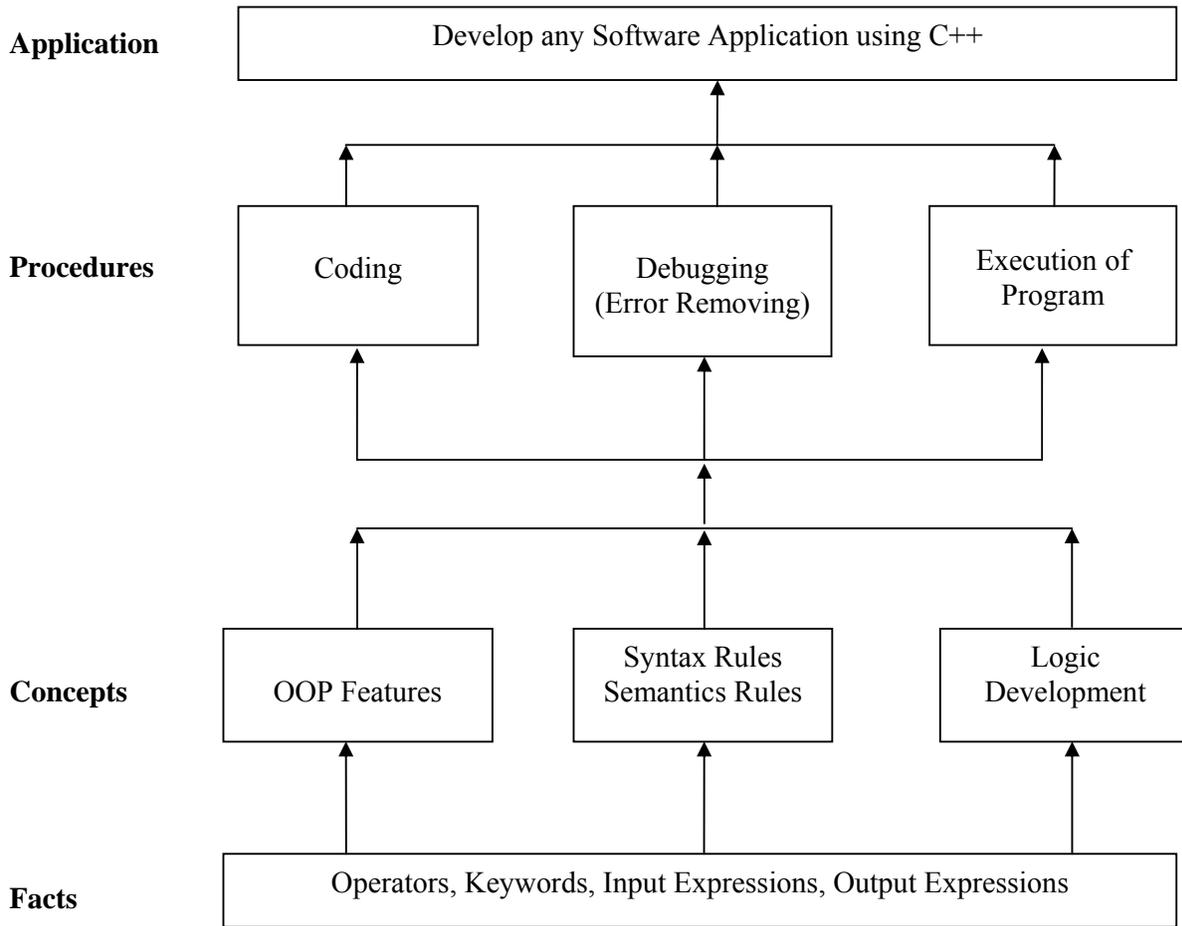
Intellectual Skills:

1. Understand the concepts of OOP.
2. Implement programs based on OOP concepts.
3. Understand basic fundamentals of C++.
4. Develop small software applications using C++.

Motor Skills:

1. Proper Handling of Computer System.

Learning Structure:



Theory:

Topic No	Contents	Hours	Marks
1	<p>Principles of Object Oriented Programming Objectives:</p> <ul style="list-style-type: none"> ➤ State OOP's basic Concepts. ➤ Difference between OOP & POP. ➤ C++ Programming structure. <p>1.1 Its need & requirement, Procedure Oriented Programming (POP) verses Object Oriented Programming (OOP), Basic concepts of Object Oriented Programming, Object Oriented Languages, Applications of OOP.</p> <p>1.2 Beginning with C++: What is C++? , keywords, variables, constants basic data types, operators, scope resolution operator, memory management operators, console input/output, structure of C++ program.</p>	06	12
2	<p>Classes & Objects: Objectives:</p> <ul style="list-style-type: none"> ➤ Defining classes & objects. ➤ Declaring & using static data member & static member function, friend function. ➤ Programs based on classes & objects. <p>2.1 Structures in C++.</p> <p>2.2 Class & Object: Introduction, specifying a class, access specifiers, defining member functions, creating Objects, memory allocations for objects.</p> <p>2.3 Array of Objects, Object as function arguments.</p> <p>2.4 Static data members, static member function, friend Function</p>	08	20
3	<p>Constructors & Destructors Objectives:</p> <ul style="list-style-type: none"> ➤ State Concepts of constructor & destructor, types of constructor. ➤ Programs based on constructor & destructors <p>3.1 Concepts of Constructors, Types of constructors: Default, Parameterized, Copy.</p> <p>3.2 Overloaded Constructors :Multiple Constructors in a Class, Constructors with default arguments.</p> <p>3.3 Destructors.</p>	08	14
4	<p>Inheritance: Concept of Reusability Objectives:</p> <ul style="list-style-type: none"> ➤ Concept of Inheritance & its types. ➤ Types of Visibility modes. ➤ Programs based on Inheritance. <p>4.1 Introduction, defining a derived class, visibility modes & effects.</p> <p>4.2 Types of Inheritance : Single, multilevel, multiple, hierarchical, hybrid</p> <p>4.3 Virtual base class, abstract class, constructors in derived class.</p>	08	20
5	<p>Pointers in C++ Objectives:</p> <ul style="list-style-type: none"> ➤ Declare Pointer & Pointer arithmetic. 	10	18

	<ul style="list-style-type: none"> ➤ Pointer to Arrays, string & Object. ➤ “this” pointer concept. <p>5.1 Concepts of Pointer: Pointer declaration, Pointer operator, address operator, Pointer arithmetic.</p> <p>5.2 Pointer to Array: Searching, Insertion, deletion</p> <p>5.3 Pointer to String: Searching, finding length, comparisons, concatenation, reverse</p> <p>5.4 Pointer to Object: Pointer to Object, this pointer, Pointer to derived class.</p>		
6	<p>Polymorphism Objectives:</p> <ul style="list-style-type: none"> ➤ Polymorphism concept & its types. ➤ Program for overloading operators & functions. <p>6.1 Introduction, Types of polymorphism: Compile time, Run time</p> <p>6.2 Compile time Polymorphism: Function overloading, operator overloading: Overloading unary and binary operators, Rules for operator overloading.</p> <p>6.3 Run time polymorphism: Virtual functions, rules for virtual functions, pure virtual function.</p>	08	16
Total		48	100

List of Practical:

Sr. No.	Title of Experiment
1	Write a program to Input & Output data for exchanging values of two variables.
2	Develop a program to declare a class ‘person’ having data members name, age & salary. Accept and display this data for one object.
3	Write a program to declare a class ‘employee’ having data members name and age. Accept and display the data for three objects.
4	Write a program to show how static member is shared by multiple objects of the same class.
5	Develop a program to find out the mean value of a given number using friend function.
6	Develop a program to print student details of ‘stud’ class using constructor and destructor
7	Write a program to find prime number using default argument in constructor
8	Write a program to find out the payroll system using single level inheritance.
9	A. Write a program to find student details using multiple inheritance. B. Write a program to compute total marks of student using virtual base class.
10	Write a program to evaluate the largest number of an array using pointer
11	Write a program to search a character in a string using pointer.
12	Write a program to input and display code and price for two items using pointer to object.

13	Write a program to display roll_no and name of student using 'this' pointer.
14	Write a program to using function overloading to calculate volume of cube, cylinder & rectangular box
15	Write a program to overload unary '--' operator
16	Write a program to display the output using the virtual function.

Learning Resources:**1. Books:**

Sr. No.	Author	Title	Publisher
1	E Balagurusamy	Object oriented Programming with C++	Mc Graw Hill
2	Rajesh K. Shukla	Object oriented Programming in C++	Wiley India
3	B. M. Harwani	C++ for Beginners	SPD
4	Robert Lafore	Object Oriented Programming in C++ (4 th edition)	Pearson

2. CDs, PPTs Etc.:

www.vikaspublishing.com/teachermanual.aspx (PPTs available)

www.pearsoned.co.in/prc (After Registration resources are available)

3. Websites:

www.cplusplus.com

www.learncpp.com

www.sourcecodesworld.com

www.softteam.com

Course Name : Computer Engineering Group

Course Code : CO/CD/CM/CW

Semester : Fourth

Subject Title : Computer Graphics

Subject Code : 17056

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	50#	--	25@	75

Rationale:

In recent trend, every computer system interacts with the user through a graphical user interface. User can understand the information in both textual and graphical format. Computer Graphics is the study of techniques to improve communication between human and machine. Computer Graphics is one of the most existing, rapidly growing computer fields. The word Computer Graphics means pictures, graphics or scene drawn with the help of a computer system. After studying this subject, a learner will be able to work with 2-dimensional, 3-dimensional graphics, multimedia and animation techniques. It is also useful in many fields such as Engineering drawing, graphics, architectural design, video games and animations.

General Objectives:

To develop following skills:

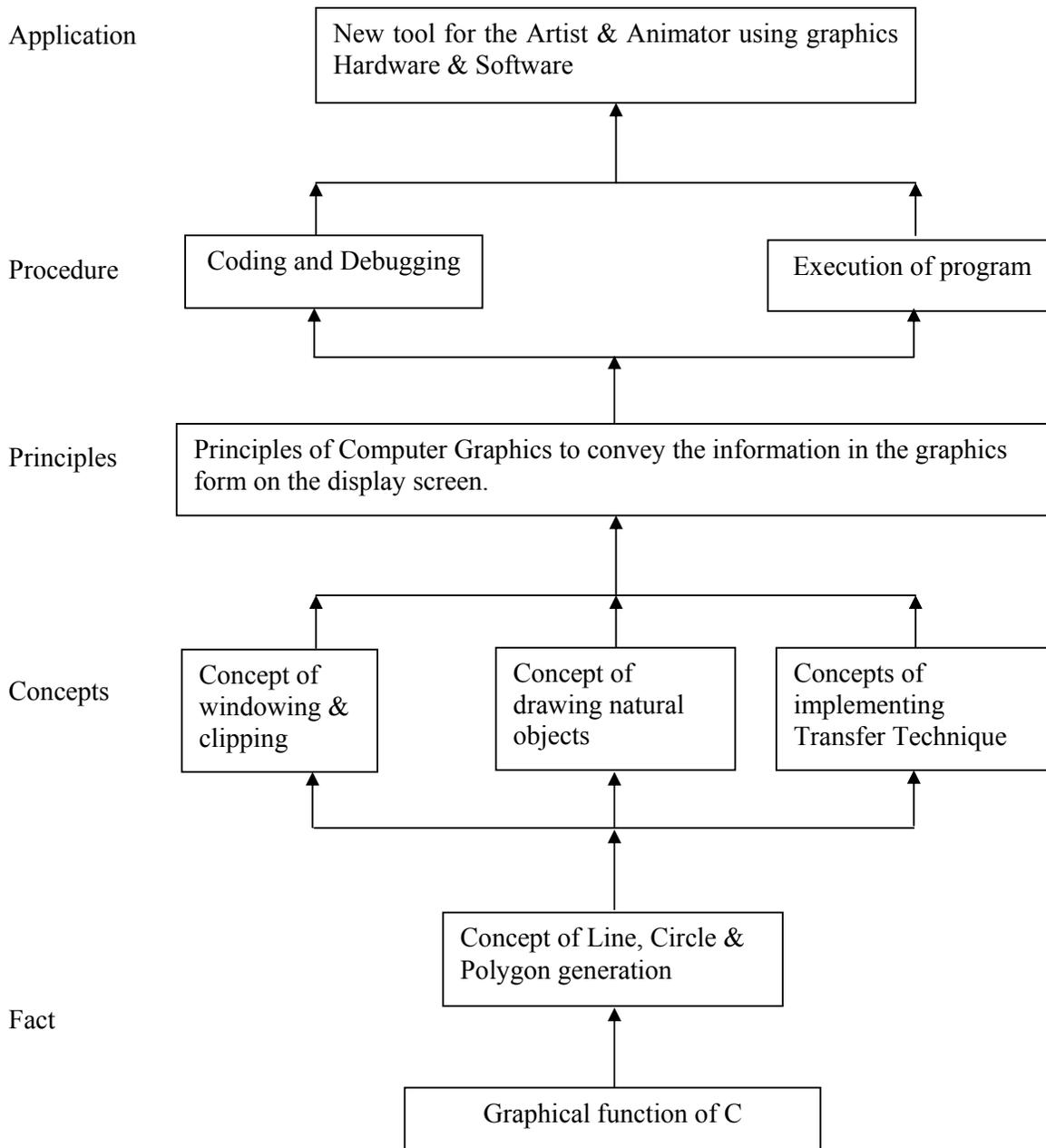
Intellectual Skills:

- Specifically develop the logic and algorithms for developing basic graphics software.
- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors such as syntax, semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as
 - Problem definition
 - Analysis
 - Design of logic
 - Coding
 - Testing
 - Maintenance (Modifications, error corrections, making changes etc.)

Motor Skills:

- Ability to handle keyboard efficiently.
- Ability to use input and output devices.
- Ability to execute C programs.
- Ability to handle computer system carefully.
- Ability to understand Color combinations.

Learning Structure:



Content:

Topic No.	Contents	Hours
01	Basics of Computer Graphics Objectives : Demonstrate text mode and graphics mode. 1.1 Raster scan display: 1.2 Primitive operations: - moveto, lineto 1.3 Graphics file formats: Basics, advantages, disadvantages – BMP – GIF – JPEG – TIFF – PCX 1.4 Graphics Mode Functions- Text mode, Graphic mode Shapes, colors,	02
02	Line, circle, and polygon. Objectives: Draw Lines using various algorithms. Generate circle with various algorithms. Draw polygons and demonstrate their filling procedures 2.1 Basic concepts in line drawing, Line drawing algorithms: DDA algorithms, Bresenham's algorithm 2.2 Circle generating algorithms: Symmetry of circle, DDA circle drawing algorithm, Bresenham's circle drawing algorithm, 2.3 Polygons – Types of polygons, inside –outside test, Polygon filling: Flood fill, Scanline algorithm.	04
03	Transformations Objectives: Demonstrate 2D transformation techniques Demonstrate 3D transformation techniques. 3.1 2D Transformation: Scaling, Reflection, Shearing, Rotation, Translation, Rotation about an arbitrary point 3.2 3D Transformation: Scaling, Rotation, Translation, Rotation about arbitrary axis	04
04	Windowing & clipping Objectives: Operate on various clipping algorithms. Summarize the different transformations. 4.1 Line clipping: Cohen-Sutherland Line clipping algorithm, Midpoint subdivision algorithm (06 Marks) 4.2 Polygon clipping: Sutherland – Hodgeman Polygon clipping algorithm.	03
05	Curves and Fractals Objectives: Draw various curves Predict various fractal types. 5.1 Curve generation: Arc generation using DDA algorithm, Interpolation, Approximation, B-Spline, Bezier curves: 5.2 Curves Fractals: Hilbert's Curve, Koch curve, Fractal lines, Fractal Surfaces.	03
Total		16

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Implement DDA algorithm and Bresennham's algorithm for line drawing.	02
2	Implement DDA algorithm and Bresennham's algorithm of circle drawing.	02
3	Implement Flood fill algorithm for Polygon filling.	02
4	Implement scan-line algorithm for polygon filling.	02
5	Write Program for 2-D transformations -> scaling, Rotation	03
6	Write Program for 2 D transformations -> shearing and Translation program	03
7	Write and implement program for rotation about an arbitrary point	03
8	Implement Cohen- Sutherland algorithm for line clipping.	03
9	Implement midpoint subdivision algorithm for line clipping.	03
10	Implement Sutherland-Hodgeman algorithm for polygon clipping.	03
11	Write a program to draw a curve using Bezier's algorithm	03
12	Write a program to draw fractal lines.	03

List of Practical oriented Projects:

- 1) Oral geometry insertion for character animation (Develop a system to create an animated mouth in head geometry)
- 2) Online storyboarding system (Create a system that will keep still images, text descriptions, sample animations, sample audio for each scene of an animation)

Learning Recourses:**1. Books:**

Sr. No	Book Title	Author	Publication
01	Computer Graphics	M.Pauline Baker & Donald Hearn	Pearson
02	Fundamentals of Computer Graphics- 3rd Edition	Peter Shirley	SPD – AK Peters
03	Computer Graphics (With CD)	Rajesh Maurya	Wiley India
04	Computer Graphics	Apurva Desai	PHI

2. Websites:

- 1) <http://www.graphics.cornell.edu/online/tutorial/>

- 2) www.graphics.standard.edu
- 3) www.cmp.uea.ac.uk/research
- 4) www.computerarts.co.uk

3. Magazines:

- 1) Computer Graphics World
- 2) In-plant Graphics
- 3) Computer Arts

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts amongst students.

Course Name : Computer Engineering Group

Course Code : CO/CD/CM/CW/IF

Semester : Fourth

Subject Title : Professional Practices-II

Subject Code : 17042

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	03	--	--	--	--	50@	50

Rationale:

Our world is witnessing a measure change in communication pattern with expansion of industrial sphere, as industries demanding more competitive and challenging students.

To create multicultural working professionals, student must have positive attitude, confidence, and ability to communicate in addition to basic technological skill.

The purpose of introducing professional practices is to provide opportunity to diploma holder to undergo activities which will enable them to develop confidence. The semester is planned with expert lectures, seminar on technical topics and soft skills, group discussion along with mini project.

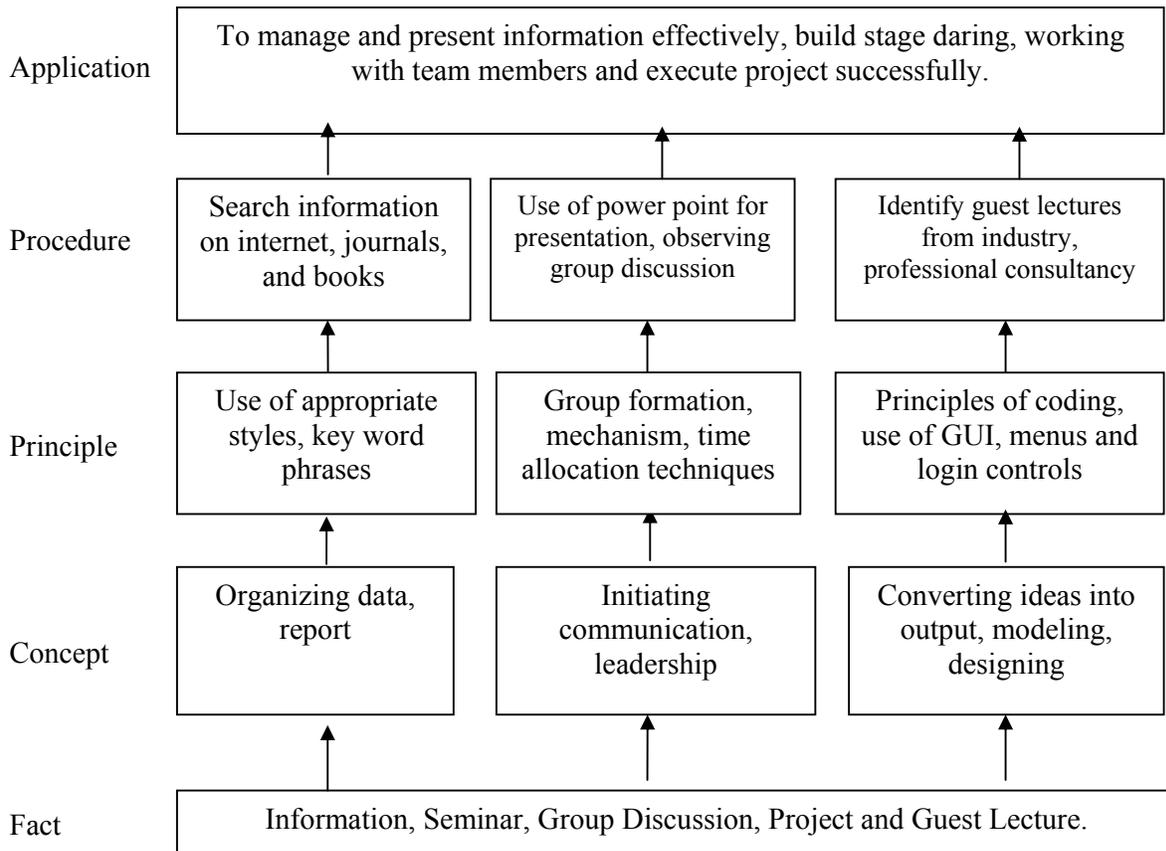
Objectives:

Intellectual Skills:

Students should be able to:

1. Acquire the knowledge from different resources.
2. Present a given topic effectively in a seminar and build a stage-daring.
3. Interact with colleague through group discussion.

Learning Structure:



Contents:

Activity	Name of Activity	Hours
1	<p>Lectures by professional, industrial experts to be organized from following or any other suitable technical areas. [Any two]: -</p> <ol style="list-style-type: none"> 1. Advanced technical writing skill 2. SAP modules and career. 3. Career trends in computer / IT field 4. Intelligent computer system. 5. Advanced trends in hardware technology. 6. Advanced programming languages in IT field. 7. Introduction to Apprenticeship Training Scheme 	04
2	<p>Information Search:- Form group of 6 students. Information should be collected from internet, news papers, journals, book etc. Each student should submit write-up about 8-10 pages from following allocated topic or any other suitable topic suggested by teacher.</p> <ol style="list-style-type: none"> 1. Human machine interface 2. Dynamic languages 3. Robotic surgery 4. Virtual keyboard 5. Wireless USB 6. Concept of cloud computing 7. Bubble sensing 8. Blu – ray disc 9. Or any other suitable topic 	06
3	<p>Seminar:- Form a group of 6 students and deliver seminar on any one of the following technical topic or any other suitable subject topic suggested by teacher for 10 minutes. Seminar should be presented in power point presentation. Students should draw notes about 8-10 pages on respected topic.</p> <ol style="list-style-type: none"> 1. Trouble shooting methods for various computer peripherals. 2. Viruses / antivirus and firewalls [checkpoints] 3. Protocols suits: - SLIP and PPP, ARP, IP- V6, ICMP-V6, TCP & UDP [each protocol may be separate topic]. 4. Stream classes in C++. 5. Exception handling in C++. 6. Pointers in C++. 7. Interrupts useful for microprocessor programming. 8. Or any other suitable topic. 	16
4	<p>Group Discussion:- Form a group of 6 students. Teacher should allocate a topic from the following list or any other suggested topic and do the group discussion for 10 minutes.</p> <ol style="list-style-type: none"> 1. Is china a threat to the Indian software industry? 2. Education is only business in these days. 3. Is male and female equal in all aspects? 4. Opinion about reservation in education sector. 5. Boom in retail sector? 6. Whether software is dominant over hardware or vice-versa? 	12

	7. Or any other topic.	
5	Mini Projects / Activities:- Form a group of 6 students. Teacher should allocate a topic for mini project from the following topics or any other suggest topic and develop the mini project. <ol style="list-style-type: none"> 1. Web site development system. 2. Database management system project 3. Animation project using C and C++. 4. System project using front end and back end. 5. Game designing. 6. Assembly of computer system and installation of application software. 	10
Total		48

Learning Resources:**1. Books:**

Sr. No.	Title
1.	Fourth semester subjects reference books
2.	Journals and magazines – IEEE Journals, IT technologies.
3.	Local news papers and events
4.	Apprenticeship Training Scheme:- Compiled By – BOAT (Western Region), Mumbai, Available on MSBTE Web Site.

2. Websites:

1. <http://www.wikipedia.com>
2. <http://www.seminarforyou.com>

Course Name : All Branches of Diploma in Engineering & Technology

**Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/
ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/FG**

Industrial Training (Optional) after 4th semester examination.

Note:- Examination in Professional Practices of 5th Semester.

INDUSTRIAL TRAINING (OPTIONAL)

Rational:-

There was a common suggestion from the industry as well as other stakeholders that curriculum of Engineering and Technology courses should have Industrial training as part of the curriculum. When this issue of industrial training was discussed it was found that it will be difficult to make industrial training compulsory for all students of all courses as it will be difficult to find placement for all the students. It is therefore now proposed that this training can be included in the curriculum as optional training for student who is willing to undertake such training on their own. The institutes will help them in getting placement or also providing them requisite documents which the student may need to get the placement.

Details:- Student can undergo training in related industries as guided by subject teachers / HOD.

- The training will be for four weeks duration in the summer vacation after the fourth semester examination is over.
- The student undergoing such training will have to submit a report of the training duly certified by the competent authority from the industry clearly indicating the achievements of the student during training. This submission is to be made after joining the institute for Fifth semester.
- The student completing this training will have to deliver a seminar on the training activities based on the report in the subject Professional Practices at Fifth Semester.
- The student undergoing this training will be exempted from attending activities under Professional Practices at Fifth semester except the seminar.
- The students who will not undergo such training will have to attend Professional Practices Classes/activities of fifth semester and will have to complete the tasks given during the semester under this head.
- There work will be evaluated on their submissions as per requirement and will be given marks out of 50. Or student may have to give seminar on training in Industry he attended.
- Institute shall encourage and guide students for Industry training.
- Evaluation:- Report of Training attended and delivery of seminar and actual experience in Industry will be evaluated in fifth semester under Profession Practices-III and marks will be given accordingly out of 50.