MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : DIPLOMA IN INFORMATION TECHNOLOGY

COURSE CODE : IF

DURATION OF COURSE : 6 SEMESTERS　　　　　　　　　**WITH EFFECT FROM 2012-13**

SEMESTER : FOURTH　　　　　　　　　**DURATION : 16 WEEKS**

FULL TIME / PART TIME : FULL TIME　　　　　　　　　**SCHEME : G**

SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		SW (17400)
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Environmental Studies $			01	--	02	01	50#*	20	--	--	--	--	25@	10	
2	Data Communication & Networking			03	--	02	03	100	40	--	--	25#	10	25@	10	
3	Object Oriented Programming β			03	--	04	03	100	40	50#	20	--	--	25@	10	
4	Computer Hardware & Maintenance β			03	--	02	03	100	40	--	--	50#	20	25@	10	50
5	Microprocessor and Programming β			03	--	02	03	100	40	--	--	--	--	25@	10	
6	Applied Multimedia Technology			--	--	04	--	--	--	50#	20	--	--	50@	20	
7	Professional Practices-II β			--	--	03	--	--	--	--	--	--	--	50@	20	
			TOTAL	13	--	19	--	450	--	100	--	75	--	225	--	50

Student Contact Hours Per Week: **32 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 900**

@- Internal Assessment, # - External Assessment, [　　] No Theory Examination, $ - Common to all branches, $ - Common to all branches, #* Online Examination, β - Common to IF

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Term Work, SW- Sessional Work.
  ➢ 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/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

Semester   : Fourth

Subject Title : Environmental Studies

Subject Code :

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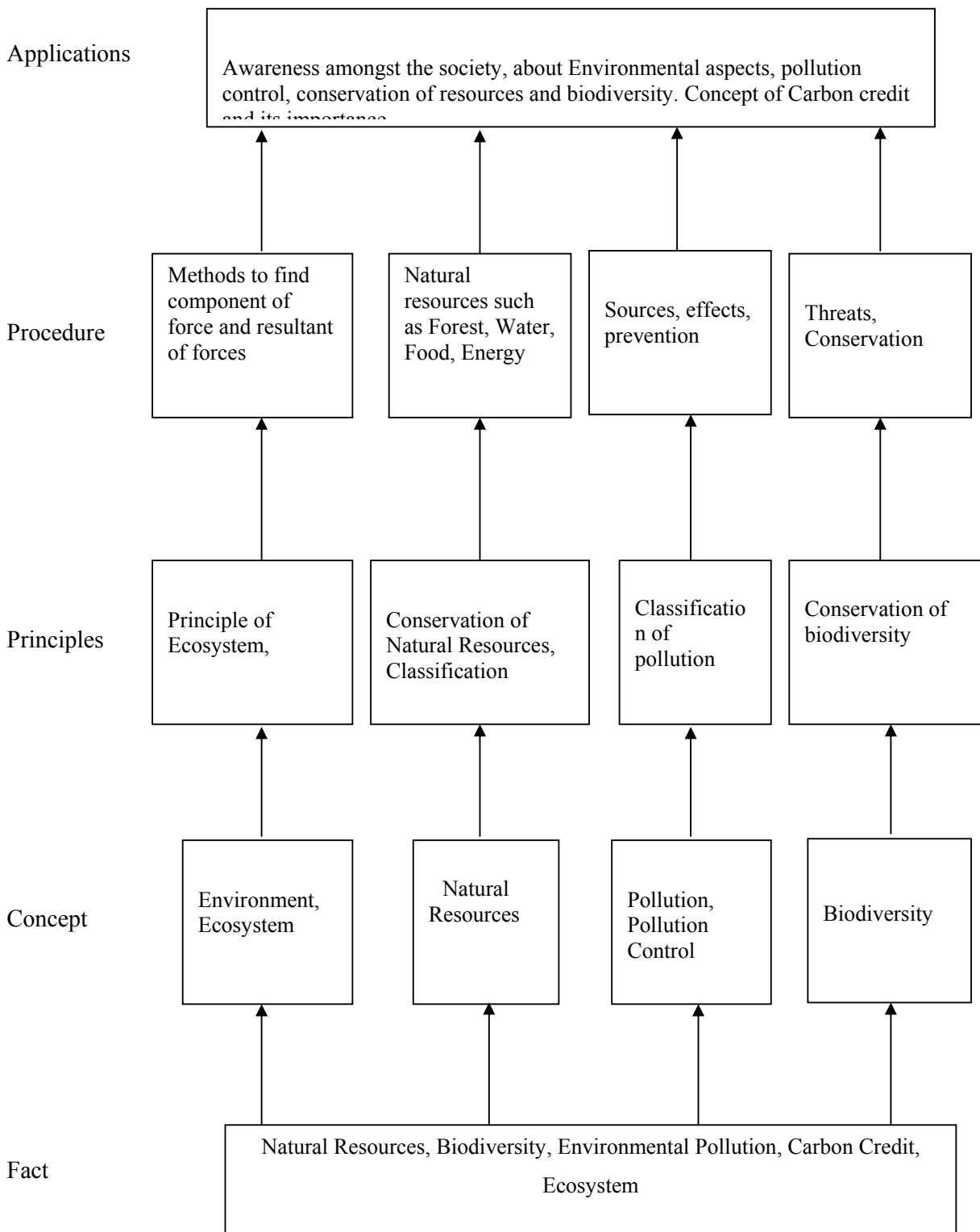
It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

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:

Applications

	Awareness amongst the society, about Environmental aspects, pollution control, conservation of resources and biodiversity. Concept of Carbon credit and its importance

Procedure

Methods to find component of force and resultant of forces	Natural resources such as Forest, Water, Food, Energy	Sources, effects, prevention	Threats, Conservation

Principles

Principle of Ecosystem,	Conservation of Natural Resources, Classification	Classification of pollution	Conservation of biodiversity

Concept

Environment, Ecosystem	Natural Resources	Pollution, Pollution Control	Biodiversity

Fact

Natural Resources, Biodiversity, Environmental Pollution, Carbon Credit, Ecosystem

Theory:

Topic and Contents	Hours	Marks

Topic 1: Nature of Environmental Studies
Specific Objectives:
  ➢ Define the terms related to Environmental Studies
  ➢ State importance of awareness about environment in general public
Contents:
  • 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

Topic 2: Natural Resources and Associated Problems
Specific Objectives:
  ➢ Define natural resources and identify problems associated with them
  ➢ Identify uses and their overexploitation
  ➢ Identify alternate resources and their importance for environment
Contents:
2.1 Renewable and Non renewable resources
  • Definition
  • Associated problems
2.2 Forest Resources
  • General description of forest resources
  • Functions and benefits of forest resources
  • Effects on environment due to deforestation, Timber extraction, Building of dams, waterways etc.
2.3 Water Resources
  • Hydrosphere: Different sources of water
  • Use and overexploitation of surface and ground water
  • Effect of floods, draught, dams etc. on water resources and community
2.4 Mineral Resources:
  • Categories of mineral resources
  • Basics of mining activities
  • Mine safety
  • Effect of mining on environment
2.5 Food Resources:
  • Food for all
  • Effects of modern agriculture
  • World food problem
	04	10

Topic 3. Ecosystems
  • Concept of Ecosystem
  • Structure and functions of ecosystem
  • Energy flow in ecosystem
  • Major ecosystems in the world
	01	04

Topic 4. Biodiversity and Its Conservation
  • Definition of Biodiversity
  • Levels of biodiversity
	02	06

• Value of biodiversity • Threats to biodiversity • Conservation of biodiversity		
Topic 5. Environmental Pollution • 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 • 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: • 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 • 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   : Diploma in Information Technology

Course Code   : IF

Semester   : Fourth

Subject Title : Data Communication & Networking

Subject Code   :

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	25#	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.
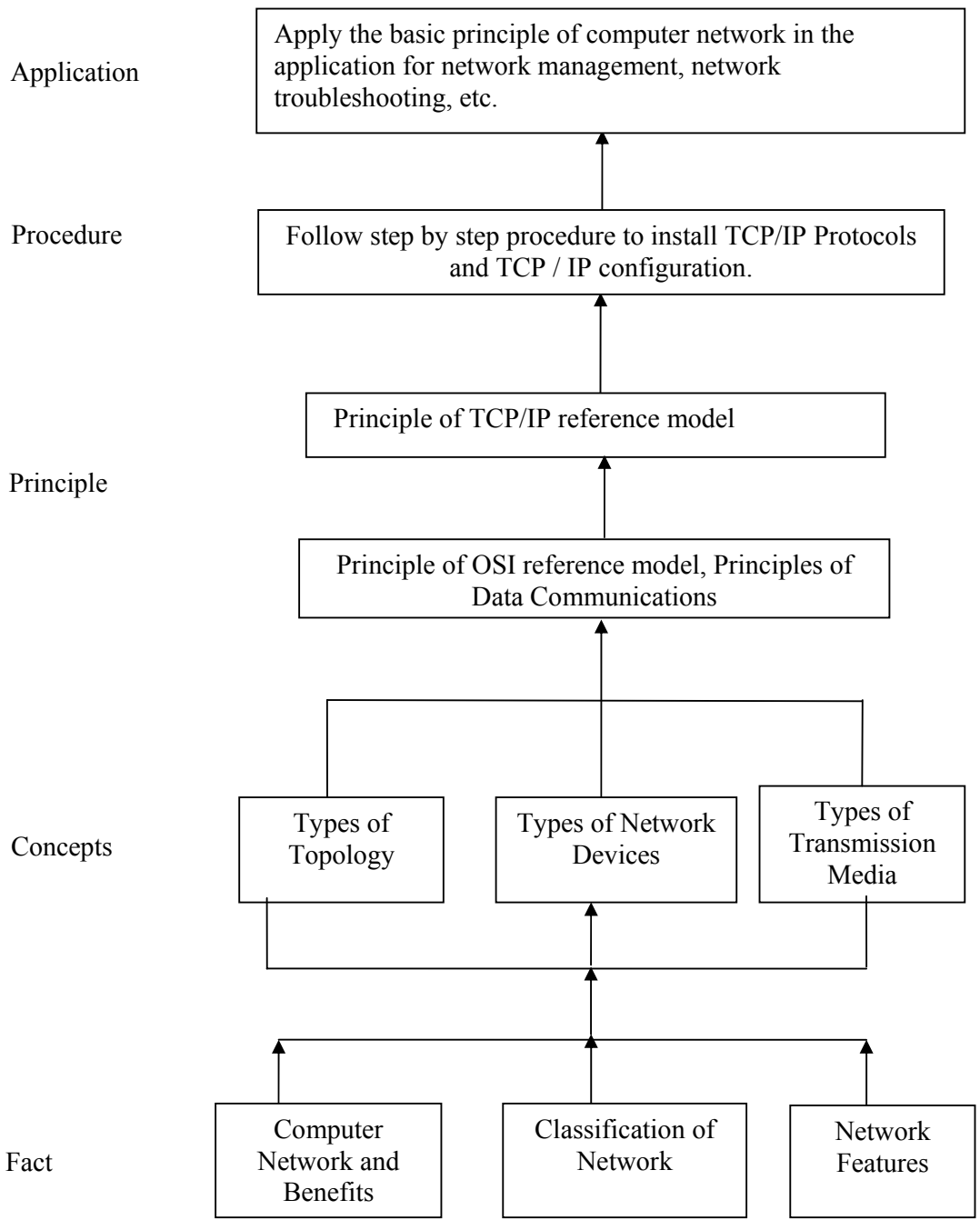
Objectives:

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:

Application

Apply the basic principle of computer network in the application for network management, network troubleshooting, etc.

Procedure

Follow step by step procedure to install TCP/IP Protocols and TCP / IP configuration.

Principle

Principle of TCP/IP reference model

Principle of OSI reference model, Principles of Data Communications

Concepts

| Types of Topology | Types of Network Devices | Types of Transmission Media |

Fact

| Computer Network and Benefits | Classification of Network | Network Features |

Theory:

Chapter	Name of the Topic	Hours	Marks
01	**Introduction to Data Communication and Networking** **Objectives:-** ➢ Understand Basic Concept of Data Communication ➢ Understand Analog and Digital Transmission Methods. ➢ Differentiate between Baud rate and Bit rate. 1.1 Introduction, Fundamental Concepts, Data Communication, protocols, Standards, Standard organizations, Bandwidth and Data Transmission Rate. 1.2 Analog Signal, Analog Transmission, Digital Signal ,Digital Transmission, Digital Signal Analog Transmission, Baud Rate and Bits per second 1.3 Modes of Data Transmission and Multiplexing, Parallel and Serial Communication, Asynchronous, Synchronous and Isochronous Communication, Simplex, Half-Duplex, Full Duplex, Multiplexing and Demultiplexing, Types of Multiplexing: TDM, FDM , TDM Vs FDM	10	20
02	**Transmission Errors: Detection and Correction, Transmission Media and Network Topologies** **Objectives:-** ➢ Understand Errors and Error Correction ➢ Understand Types of Medias. ➢ Understand various Network Topologies and Network Control Devices 2.1 Introduction, Error Classification, Types of Errors and Error Detection 2.2 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. 2.3 Introduction IEEE Standards for LAN,MAN and WAN 802.1, 802.2, 802.3, 802.4, 802.5, 802.11 2.4 Latest Technologies in Wireless Network-Bluetooth Architecture, Wi-Fi, Wi- Max 2.5 Cellular (Mobile) Telephone - Band in Cellular Telephony, Calls using Mobile Phones, Transmitting receiving / Handoff operations 2.6 Network Topologies, Switching and Routing Algorithms: Introduction Star, Ring, Tree, Bus, Mesh, Hybrid, Basics of Switching, Router and Routing , Routing Algorithms.	10	22
03	**OSI Model, LAN,WAN,MAN, MAC Sublayer** **Objectives:-** ➢ Understand OSI Model ➢ Understand LAN/WAN/MAN ➢ Understand MAC Sublayer 3.1 Introduction– Layered Architecture , Peer-to- Peer Processes-Interfaces between Layer, Protocols, Organization of the Layers,	12	22

	Encapsulation. 3.2 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. 3.3 LAN, Ethernet, Virtual LAN, Fast and Gigabit Ethernet, Token Ring, FDDI, Comparison of Ethernet,Token Ring FDDI, MAN, Distributed Queue Dual Bus, SMDS, WAN and its architecture, WAN transmission Mechanism, WAN Addressing , Packet Forwarding , Next Hiop tables and Routing, Pure and Slotted ALOHA 3.4 MAC Sublayer : Introduction, Static and Dynamic Channel Allocation, MAC Sublayer, MAC in LAN and WAN, Classification and study of MAC Sublayer Protocols/Collisions.		
04	**Internetworking Concepts, Devices, Internet Basics , History And Architecture** **Objectives:-** ➢ Understand Internetworking and Issues ➢ Understand Internetworking Issues ➢ Understand the concept of ISP 4.1 Introduction–Why Internetworking, Problems in Internetworking, Dealing with Incompatibility, Vistual Network, Internetworking Devices, Repeaters, Bridges, Routers, Gateways 4.2 Brief History of Internet, Growth of Internet, Internet Topology, Internal Architecture of ISP. 4.3 Ways of Accessing the Internet : Introduction, Dial Up access for an Individual User, Leased Lines, DSL and Cable Modems	08	18
05	**TCP/IP, ARP, RARP and ICMP, TCP vs UDP , DNS, Email , FTP** 5.1 Introduction, TCP/IP Basics, Why IP addresses, Logical Addresses, Concept of IP Address and IP datagram Packet, ARP, RARP, ICMP, Data Fragmentation and Reassembly, Comparison of OSI and TCP/IP Protocol Suites. 5.2 TCP and UDP :Introduction, TCP Basics, Features of TCP, Relationship between TCP and IP, Ports and Sockets, Connections, TCP Connections, Packet Format, Persistent TCP Connection, UDP and UDP Packet . 5.3 Introduction DNS, TCP,FTP TFTP	08	18
	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.	02
2	To understand Transmission Media and Network Control devices.	04
3	To Prepare a Straight Cable and Network Cross over Cable and test by Line Tester.	04
4	To Connect Computers in Star Topology using Wired Media and any Network control Device.	02
5	To Install Network Interface Card to locate MAC address of Computer.	02

6	To Configure Peer-to-Peer Network.	02
7	To Share Printer and Folder in Network.	04
8	To Install TCP/IP Protocols (version 4 and /version 6) and configure advanced TCP/IP Protocols. Install Wireshark software and configure as a packet sniffer.	04
9	To Run Basic TCP/IP Utilities and Networking commands with all options (Ping,Ping ::1, ipconfig, Tracert, Netstat, Wireshark, ARP, NBTSTAT.EXE, WINIPCFG.EXE),	04
10	Capture TCP, UDP, IP, ARP, ICMP, Telnet, FTP packets using Wireshark packet sniffer software and verify header fields.	04

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, Wiley
5	Networking + Certification (Second Edition)	Microsoft Press	PHI(Prentice-Hall of India Private Limited)
6	Computer Network by	Andrew S. Tanenbaum	Pearson

Course Name : **Computer Engineering Group**

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

Semester : **Fourth**

Subject Title : **Object Oriented Programming**

Subject Code : **174**

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:
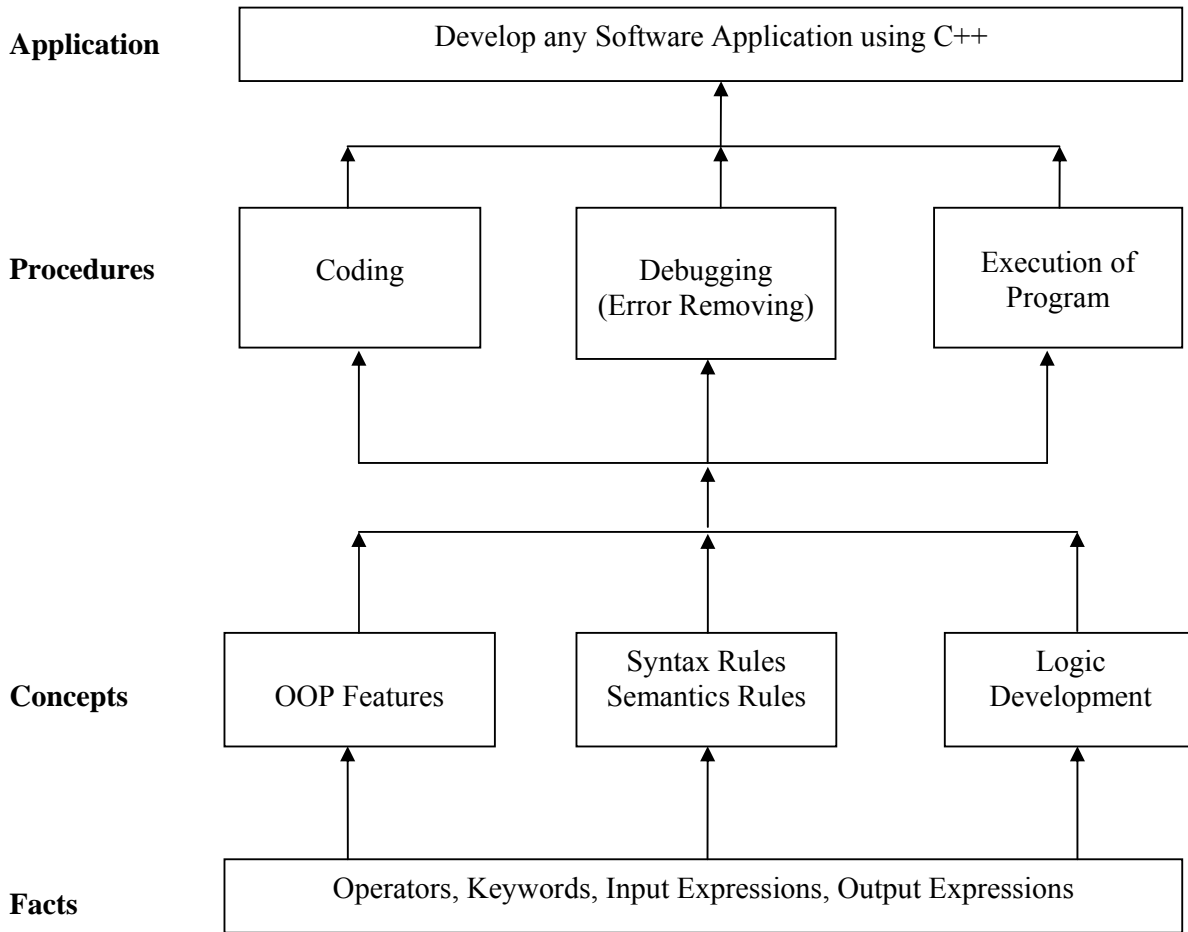
To develop following skills:

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:

Application

Develop any Software Application using C++

Procedures

Coding	Debugging (Error Removing)	Execution of Program

Concepts

OOP Features	Syntax Rules Semantics Rules	Logic Development

Facts

Operators, Keywords, Input Expressions, Output Expressions

Theory:

Topic No	Contents	Hours	Marks

1	**Principles of Object Oriented Programming**
	Objectives:
	  ➢ State OOP's basic Concepts.
	  ➢ Difference between OOP & POP.
	  ➢ C++ Programming structure.
	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.
	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.
		06	12

2	**Classes & Objects:**
	Objectives:
	  ➢ Defining classes & objects.
	  ➢ Declaring & using static data member & static member function, friend function.
	  ➢ Programs based on classes & objects.
	2.1 Structures in C++.
	2.2 Class & Object: Introduction, specifying a class, access specifies, defining member functions, creating Objects, memory allocations for objects.
	2.3 Array of Objects, Object as function arguments.
	2.4 Static data members, static member function, friend Function
		08	20

3	**Constructors & Destructors**
	Objectives:
	  ➢ State Concepts of constructor & destructor, types of constructor.
	  ➢ Programs based on constructor & destructors
	3.1 Concepts of Constructors, Types of constructors: Default, Parameterized, Copy.
	3.2 Overloaded Constructors :Multiple Constructors in a Class, Constructors with default arguments.
	3.3 Destructors.
		08	14

4	**Inheritance: Concept of Reusability**
	Objectives:
	  ➢ Concept of Inheritance & its types.
	  ➢ Types of Visibility modes.
	  ➢ Programs based on Inheritance.
	4.1 Introduction, defining a derived class, visibility modes & effects.
	4.2 Types of Inheritance : Single, multilevel, multiple, hierarchical, hybrid
	4.3 Virtual base class, abstract class, constructors in derived class.
		08	20

5	**Pointers in C++** **Objectives:** ➢ Declare Pointer & Pointer arithmetic.	10	18

	➤ Pointer to Arrays, string & Object. ➤ "this" pointer concept. 5.1 Concepts of Pointer: Pointer declaration, Pointer operator, address operator, Pointer arithmetic. 5.2 Pointer to Array: Searching, Insertion, deletion 5.3 Pointer to String: Searching, finding length, comparisons, concatenation, reverse 5.4 Pointer to Object: Pointer to Object, this pointer, Pointer to derived class.		
6	**Polymorphism** **Objectives:** ➤ Polymorphism concept & its types. ➤ Program for overloading operators & functions. 6.1 Introduction, Types of polymorphism: Compile time, Run time 6.2 Compile time Polymorphism: Function overloading, operator overloading: Overloading unary and binary operators, Rules for operator overloading. 6.3 Run time polymorphism: Virtual functions, rules for virtual functions, pure virtual function.	08	16
	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Programs to input and output data.	04
2	Programs using classes and objects.	04
3	Programs using array of objects.	04
4	Programs using static data members and static member functions.	04
5	Programs using friend function.	04
6	Programs using constructor and destructor.	04
7	Programs using constructor with default arguments.	04
8	Programs using single level and multilevel inheritance.	04
9	Programs using multiple inheritance and virtual base class.	04
10	Programs using pointer to array.	04
11	Programs using pointer to string.	04
12	Programs using pointer to object.	04
13	Programs using this pointer.	02
14	Programs using function overloading.	04
15	Programs using operator overloading.	06
16	Programs using virtual function.	04

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++ (4th 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.softeam.com

Course Name   : Computer Engineering Group

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

Semester   : Fourth

Subject Title   : Computer Hardware & Maintenance

Subject Code   : 17332

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	50#	25@	175

NOTE:

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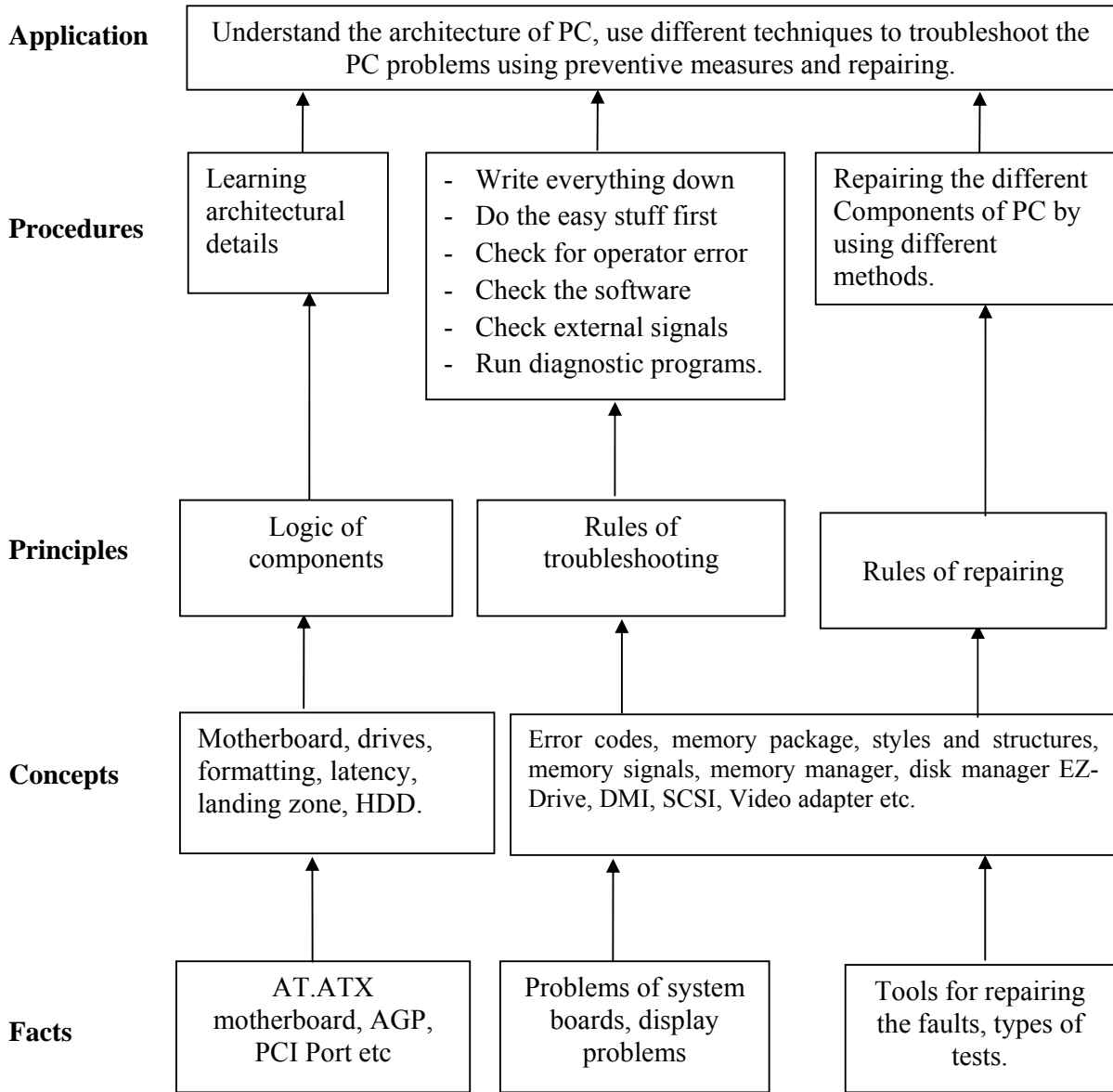
Rationale:

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:

Application

> Understand the architecture of PC, use different techniques to troubleshoot the PC problems using preventive measures and repairing.

Procedures

> Learning architectural details

> - Write everything down
> - Do the easy stuff first
> - Check for operator error
> - Check the software
> - Check external signals
> - Run diagnostic programs.

> Repairing the different Components of PC by using different methods.

Principles

> Logic of components

> Rules of troubleshooting

> Rules of repairing

Concepts

> Motherboard, drives, formatting, latency, landing zone, HDD.

> Error codes, memory package, styles and structures, memory signals, memory manager, disk manager EZ-Drive, DMI, SCSI, Video adapter etc.

Facts

> AT.ATX motherboard, AGP, PCI Port etc

> Problems of system boards, display problems

> Tools for repairing the faults, types of tests.

Theory:

Sr. No	Theory	Hrs.	Marks

1	**Motherboard & Its Component**
	Specific Objectives
	  ➤ 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.
	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.
		12	24

2	**Storage Devices & Interfacing.**
	Objective
	  ➤ To understand the Recording techniques in storage devices.
	  ➤ To understand the working of storage devices.
	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.
		08	24

3	**Display Devices & Interfacing** **Objective** ➢ To understand the construction and working of display devices like CRT, LCD. ➢ To understand the Interfacing of above devices to PC. 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	06	12
4	**Input and Output Devices** **Objective** ➢ To understand the construction and working of Input /Output Devices. ➢ To understand the Interfacing of the above peripherals. 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.	06	12
5	**Power Supplies** **Objective** ➢ To understand the working of SMPS. ➢ To understand the power problems. 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	04	08
6	**Interfaces** **Objective** ➢ To understand the ports of PC. ➢ To understand interfacing techniques of devices to ports 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	06	12

7	**PC Troubleshooting, Maintenance and Tools.** **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	06	08
	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:
1. Drawing the motherboard layout of Latest motherboard and studying the chipset through data books or Internet.
2. CMOS setup of Latest motherboard.
3. Hard Disk Partitioning.
4. Study of HDD: Identify various components of HDD and write their functions.
5. Study and installation of any one display cards: VGA or SVGA display cards.
6. Installation of Scanner, Printers and Modems.
7. Study of SMPS (ATX)
8. Study of Diagnostic Software(Any one)
9. Fault findings:
   (a) Problems related to monitor
   (b) Problems related to CPU.
   (c) Problems related to hard disk
   (d) Problems related with printer
   (e) Problems related with other devices.
10. Assembling of PC and Installation of operating system.
11. To install system as a server.

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/IF

Semester   : Fourth

Subject Title : Microprocessor and Programming

Subject Code : 174

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

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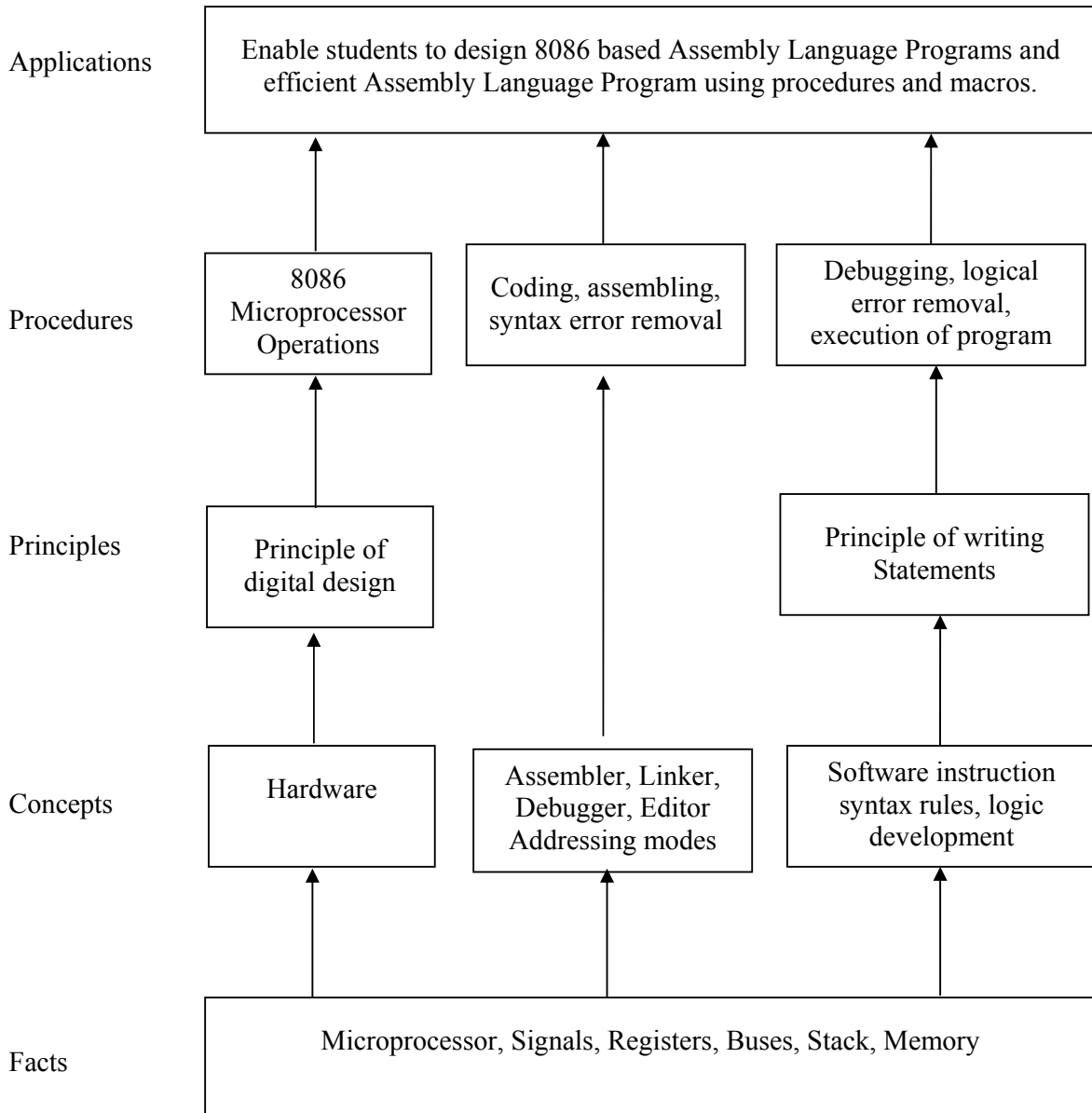
This subject covers Basics of 8085, architecture of 8086 along instruction set. It also covers assembly language programming with effective use of procedure and macros. This will act as base for the advanced assembly language programming for next generation microprocessors.

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:

Applications

```
Enable students to design 8086 based Assembly Language Programs and
efficient Assembly Language Program using procedures and macros.
```

Procedures

```
8086
Microprocessor
Operations
```

```
Coding, assembling,
syntax error removal
```

```
Debugging, logical
error removal,
execution of program
```

Principles

```
Principle of
digital design
```

```
Principle of writing
Statements
```

Concepts

```
Hardware
```

```
Assembler, Linker,
Debugger, Editor
Addressing modes
```

```
Software instruction
syntax rules, logic
development
```

Facts

```
Microprocessor, Signals, Registers, Buses, Stack, Memory
```

Theory

Name of Topics	Hours	Marks

Topic 1: Basics of Microprocessor
 Specific Objective: Students will be able to
    ➤ Draw the architecture of 8085
    ➤ Define the functions of different pins of 8085
    ➤ Identify status of different flags
 1.1 Evolution of Microprocessor and types
 1.2 8085 Microprocessor,
    • Salient features
    • Pin description,
    • Architecture of 8085 - Functional Block diagram,
    • Register organization,
	04	08

Topic 2 :16 Bit Microprocessor: 8086
 Specific Objective: Students will be able to
    ➤ Define the functions of different pins
    ➤ Draw functional block diagram of 8086
    ➤ Understand the operating modes of 8086
 2.1 8086 Microprocessor,
    • Salient features
    • Pin descriptions
    • Architecture of 8086 - Functional Block diagram
    • Register organization,
    • Concepts of pipelining,
    • Memory segmentation
    • Physical memory addresses generation.
 2.2 Operating Modes of 8086
    • 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

Topic 3 : Instruction Set of 8086 Microprocessor
 Specific Objective: Students will be able to
    ➤ Understand the different types of instructions
    ➤ Identify the addressing modes of instructions
    ➤ State the operation of an instructions
 3.1 Machine Language Instruction format,
    addressing modes
 3.2 Instruction set, Groups of Instructions
    • 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

Specific Objective: Students will be able to
   ➢ Know the program development steps
   ➢ Use the different program development tools
   ➢ Illustrate the functions of assembler directive and operators
4.1 Program development steps
   • Defining problem,
   • Writing Algorithms
   • Flowchart
   • Initialization checklist
   • Choosing instructions
   • Converting algorithms to assembly language programs.
4.2 Assembly Language Programming Tools
   • Editors
   • Assembler
   • Linker
   • Debugger.
4.3 Assembler directives and Operators		

Topic 5: 8086 Assembly Language Programming.
Specific Objective: Students will be able to
   ➢ Write a appropriate programs using editor
   ➢ Run program using assembler and linker
   ➢ Debug program using debugger
5.1 Model of 8086 assembly language programs
5.2 Programming using assembler -
   • 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

Topic 6 : Procedure and Macro in Assembly Language Program
Specific Objective: Students will be able to
   ➢ Understand the purpose of procedure and macros
   ➢ Use procedure and macros
6.1 Procedure
   • Defining Procedure - Directives used, FAR and NEAR
   • CALL and RET instructions.
   • Reentrant and Recursive procedures.
   • Assembly Language Programs using Procedure
6.2 Defining Macros.
   • 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.pcguide.com/ref/CPU
www.CPU-World.com/Arch/
www.techsource .com / engineering- parts/microprocessor.html

Course Name : Diploma in Information Technology

Course Code   : IF

Semester   : Fourth

Subject Title   : Applied Multimedia Technology

Subject Code : 174

Teaching and Examination Scheme

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

Rationale:

       Technology moves on a tremendous pace. In modern society, multimedia technology deals with developments in communication, internet, hardware technologies and tools.

The contents of this subject portray the present and future developments in the area of multimedia.
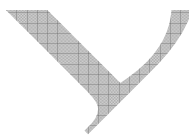
       It is a practical oriented subject which provides the students an insight into various fonts, basic shapes, images, audio formats, video formats, animation controls and tools.

General Objectives:

Students will be able to

- ➢ To know multimedia fundamentals and multimedia architecture.
- ➢ To understand need of data compression and various compression techniques.
- ➢ To know concepts of text, image, audio, video and animation
- ➢ To use multimedia tool-Flash, Adobe, Dreamweaver

Learning Structure:

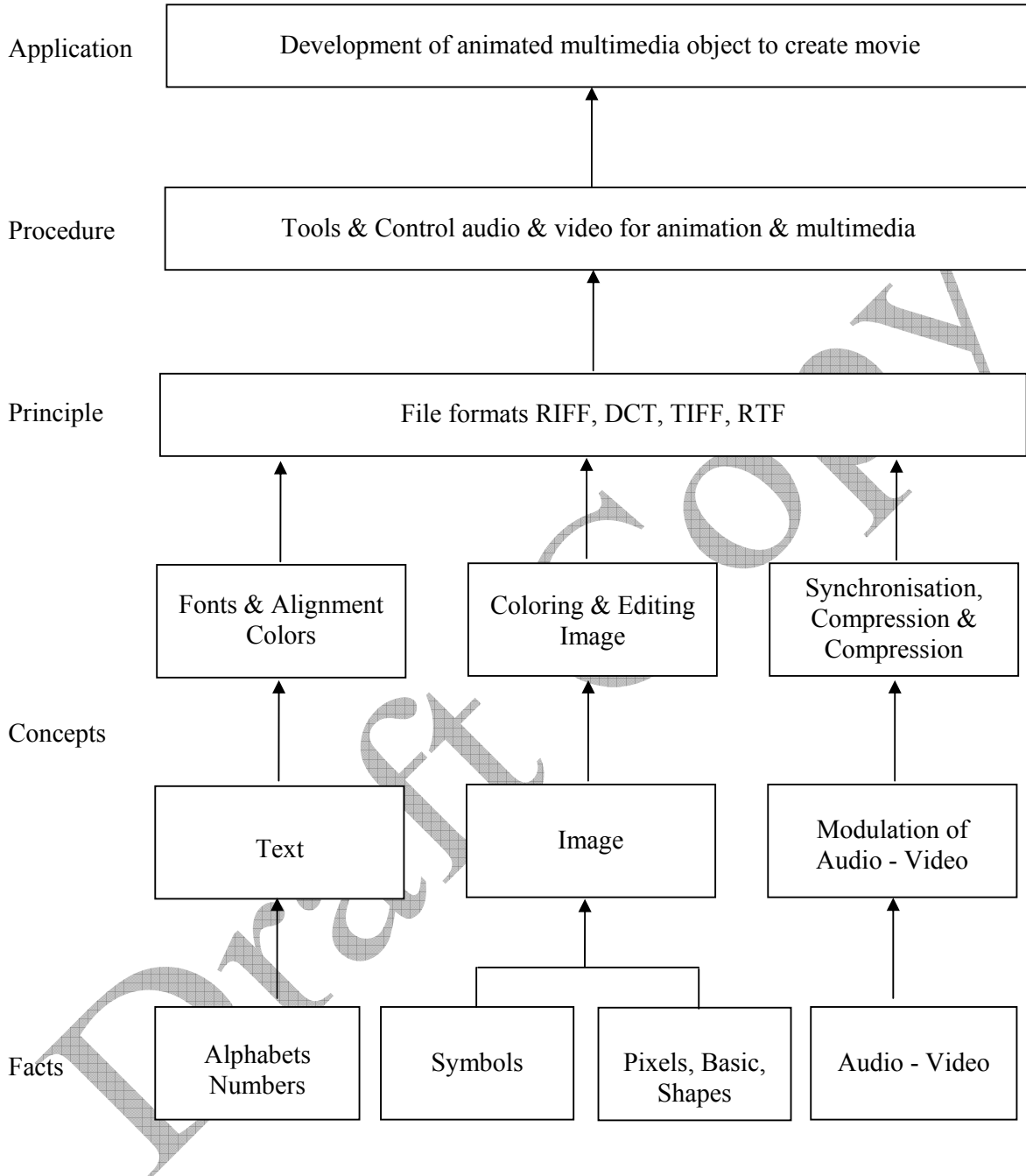|	
Application	Development of animated multimedia object to create movie

↑

Procedures	Tools & control audio & video for Animation & Multimedia

↑

Principle	File formats RIFF, DCT, TIFF, RTF

↑

Concepts

Fonts & Alignment Colours	Colouring & Editing image	Synchronisation, Compression & Compression

Text	Image	Modulation of Audio - video

Facts

Alphabets numbers	Symbols	Pixels, basic shapes	Audio & video

Learning Structure:

Application — Development of animated multimedia object to create movie

Procedure — Tools & Control audio & video for animation & multimedia

Principle — File formats RIFF, DCT, TIFF, RTF

Concepts — Fonts & Alignment Colors | Coloring & Editing Image | Synchronisation, Compression & Compression

Text | Image | Modulation of Audio - Video

Facts — Alphabets Numbers | Symbols | Pixels, Basic, Shapes | Audio - Video

Content:

Note: Contents of theory should be taught in practical period with the help of LCD projector.

Sr. No.	Activity	Hours
1	**Introduction to Flash** • Introduction to Multimedia tool – Flash • Creating & Modifying elements • Line tool, fill/attributes, different shapes, text tools & pen tool **Activity:** Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects.	04
2	**Dream weaver and Firework** Activity: • To set up website in Dreamweaver. • To create content using Microsoft Word. • To copy content from Word and paste in web page. • To create CSS DIV to hold navigation index. • To create page navigation index. • To link page index to page content using anchors.	03
3	**Theory: compression and Decompression** • Need , Types , Evaluating & Visibility • Evaluating the Compression System, Types of compression , • Need of Data Compression • Color Gray Scale and Still Video Image • Color Characteristics • Color Model **Activity:** Find answers through software and try to incorporate in the practicals • How much Compression require? • How Good is Picture, • How fast Does it Compress or Decompress, • What is effect of hardware on the multimedia application development? • Does it take, Redundancy & Usability in consideration?	03
4	**Theory: Jpeg Architecture. Formats** **Activity:** Use theory concepts in the practicals	02
5	**Theory:** Mpeg architecture and File format • MPEG-objectives, Architecture, BIT stream syntax performance • MPEG2 & MPEG4	02
6	**Theory:** Revision of Basic tag , Cascaded , Inline and Embedded style , Javascript for Client side validation like Blank check , String check for name, Numeric check for telephone number , validate email address , date of birth **Activity:** Construction of website using text , picture/Graphics / Audio /Video using flash, HTML, DHMTL, CSS, Scripts	02

Intellectual skills:
- To create and edit images using image editing software
- To create animation, build and play movie
- To integrate Audio and Video
- To integrate Multimedia in web page

Motor Skills:

Proper handling of computer system with multimedia system

List of Practical:

Sr. No	Name Practical	Hours
1	Design an Advertisement in Flash	2
2	Implement C/VB program to Read BMP , Jpeg , GIF image and display	2
3	Write program for Small Website college, Mall, School , Theatre etc. which include basic components	2
4	Create multimedia database for student ID card preparation ie. storage image in data base	2
5	Edit the sample movie clip using Adobe premiere software	2
6	Design a game/application in flash	2
7	Implement Calculator and Media Player with voice control: Button, Label ,Text box control of VB, How use OCX control in VB , Mediaplayer, DirectSS and Direct SR component of VB.	2
8	Implement C/VB program to Display color, height, width, resolution ,and other such tag value of Different image formats	2

Learning Resources:

Sr. No.	Author	Title	Publisher
1	Chris Grover	Flash CS6: The Missing Manual	Shroff Publisher
2	Ze-Nian Li, Mark S. Drew	Fundamentals of Multimedia	PHI
3	David sawyer	Dreamweaver CS6:The Missing Manual	Shroff Publisher

Weblinks:
1) www.mediacollege.com/adobe/premiere/pro/
2) www.echoecho.com/flash.htm

Equipment List/ Tools:-

Hardware Tools:-
1) Computer System (Pentium-IV or Higher Version).
2) LCD Projector.

Software Tool:-1) Flash
2) Dreamweaver
3) Adobe Premiere (video editing software)

Course Name : Computer Engineering Group

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

Semester   : Fourth

Subject Title : Professional Practices-II

Subject Code :

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.

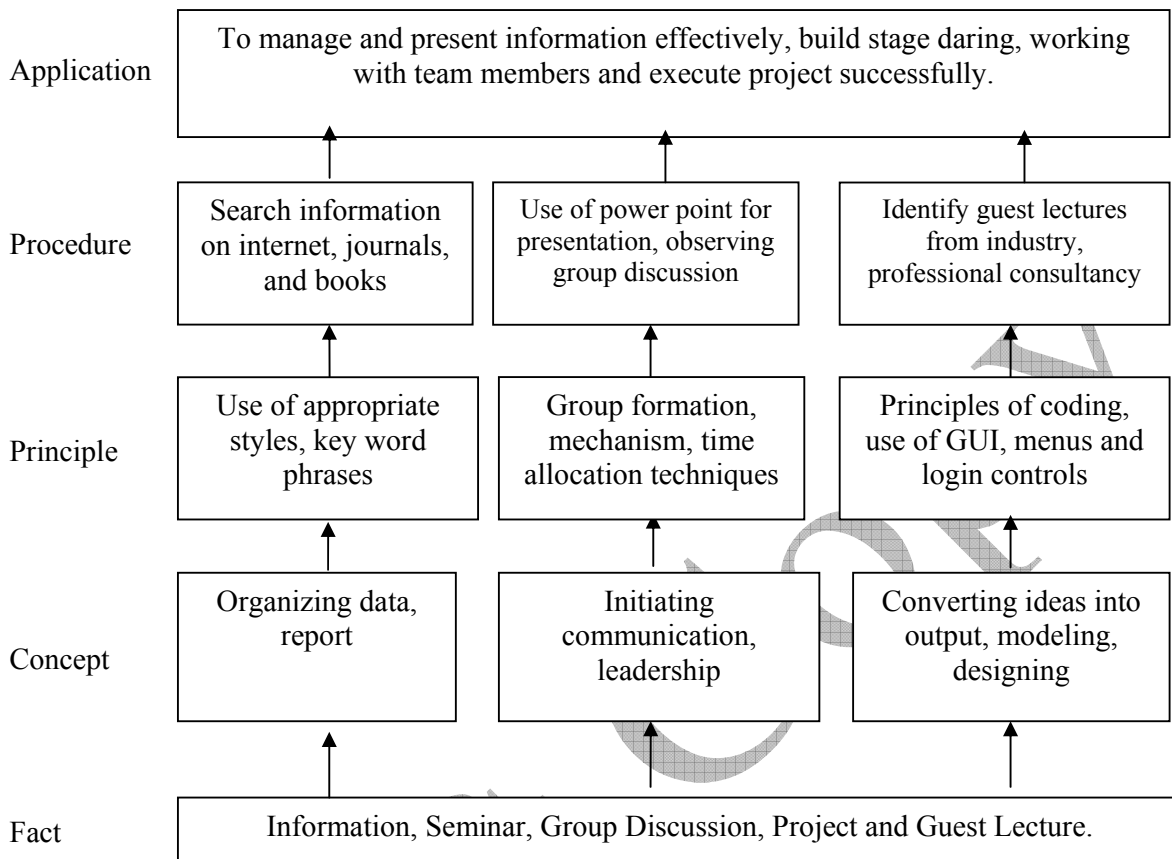**Objectives**:

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:

Application	To manage and present information effectively, build stage daring, working with team members and execute project successfully.

Procedure	Search information on internet, journals, and books	Use of power point for presentation, observing group discussion	Identify guest lectures from industry, professional consultancy
Principle	Use of appropriate styles, key word phrases	Group formation, mechanism, time allocation techniques	Principles of coding, use of GUI, menus and login controls
Concept	Organizing data, report	Initiating communication, leadership	Converting ideas into output, modeling, designing
Fact	Information, Seminar, Group Discussion, Project and Guest Lecture.		

Contents:

Activity	Name of Activity	Hours

1	**Lectures by professional, industrial experts to be organized from following or any other suitable technical areas.**
	[Any two]: -
	  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.
		04

2	**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.
	  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	**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.
	  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	**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.
	  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?
	  7. Or any other topic.
		12

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.** 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

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

2. Websites:
1. http://www.wikipedia.com
2. http://www.seminarforyou.com