STATE BOARD OF TECHNICAL EDUCATION, JHARKHAND

TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING / COMPUTER TECHNOLOGY.

COURSE CODE : CO/CM

DURATION OF COURSE : SIX SEMESTERS　　　　　　　　　　**WITH EFFECT FROM 2011-12**

YEAR / SEMESTER : FIFTH SEMESTER　　　　　　　　　　　**DURATION : 16 WEEKS**

PATTERN : FULL TIME - SEMESTER

SR. NO.	SUBJECT TITLE	Abbrev iation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (16005)
				TH	TU	PR	PAPER HRS	TH (01)		PR (04)		OR (08)		TW (09)		
								MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	Software Engineering	SWE	12175	03	--	--	03	100	40	--	--	--	--	--	--	50
2	Java Programming	JPR	12176	03	--	04	03	100	40	50#	20	--	--	25@	10	
3	Computer Security	COS	12177	03	--	--	03	100	40	--	--	--	--	--	--	
4	Operating System	OPS	12178	03	--	02	03	100	40	--	--	--	--	25@	10	
5	**Elective – I (Any One) for CM Only (Computer Technology)**															
	Data Base Management	DBM	12179	03	--	04	03	100	40	--	--	--	--	25@	10	
	Multimedia and Animation Technique	MAT	12180	03	--	04	03	100	40	--	--	--	--	25@	10	
	Elective – I (Any One) for CO (Computer Engineering)															
	Advanced Microprocessor	AMP	12181	03	--	04	03	100	40	--	--	--	--	25@	10	
	Windows Programming	WPR	12182	03	--	04	03	100	40	--	--	--	--	25@	10	
6	Network Management and Administration	NMA	12183	01	--	04	--	--	--	--	--	25#	10	25@	10	
7	Professional Practices-v	PPR	12184	--	--	03	--	--	--	--	--	--	--	50@	20	
			TOTAL	16	--	17	--	500	--	50	--	25	--	150	--	50

Student Contact Hours Per Week: **33 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 775**

@ Internal Assessment, # External Assessment, 　　　　　　No Theory Examination.

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Termwork, 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, TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester   : Fifth for CO/CM/IF and Sixth for CD

Subject Title : Software Engineering

Subject Code : 12175

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

> ➢ **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**

> ➢ **Total of tests marks for all theory subjects are to be converted out of 50 and**
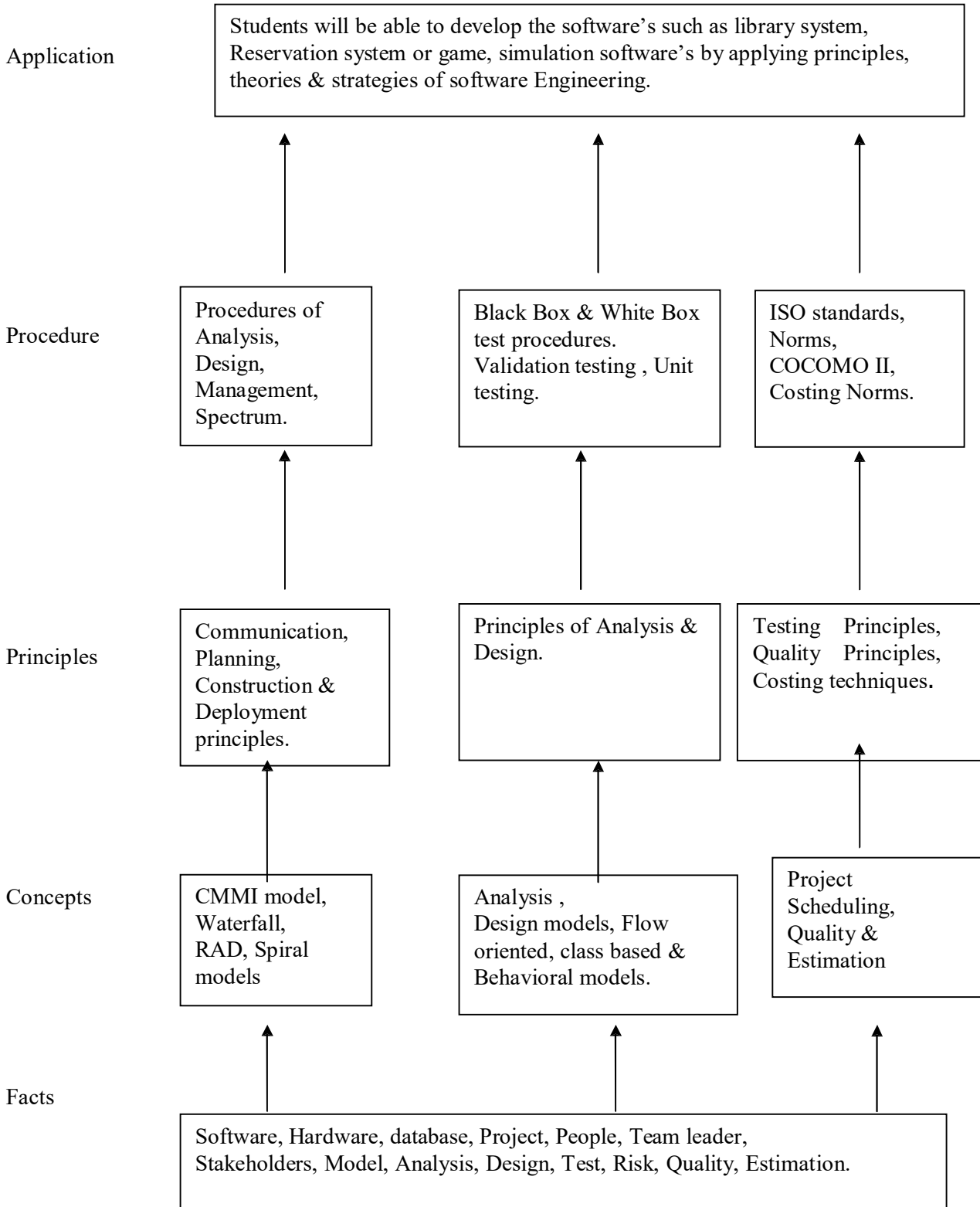> **to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

Today computer software is the single most important technology on the world stage. Software's are used by almost all peoples for various purposes such as withdrawing payments from ATM machines, paying bills of electricity, telephone using ECS systems. Airline, railway tickets reservation online etc. People can work with computers flawlessly over a long period of time. One can easily modify, upgrade the software without any problem or error. This subject helps the students to develop, design, analyze, test & implement the software project during the diploma courses in future.

Objectives:

1) Plan & develop the frame work of project.
2) Compare various project process models & use in project planning.
3) Use the principles of communication, planning, modeling construction & deployment.
4) Apply testing strategies & methods on software projects.
5) Compare various testing methods.
6) Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
7) Schedule the project according to time, size, shape, utility & application.
8) Monitor & manage the risk during the design of software project.
9) Use the parameters of software quality assurance.
10) Compare the quality factors of ISO & McCall.
11) Prepare the estimation of software.
12) Calculate the cost of software, using cost estimation models such as COCOMO II.

Learning Structure:

Application

> Students will be able to develop the software's such as library system, Reservation system or game, simulation software's by applying principles, theories & strategies of software Engineering.

Procedure

> Procedures of Analysis, Design, Management, Spectrum.

> Black Box & White Box test procedures. Validation testing , Unit testing.

> ISO standards, Norms, COCOMO II, Costing Norms.

Principles

> Communication, Planning, Construction & Deployment principles.

> Principles of Analysis & Design.

> Testing Principles, Quality Principles, Costing techniques.

Concepts

> CMMI model, Waterfall, RAD, Spiral models

> Analysis , Design models, Flow oriented, class based & Behavioral models.

> Project Scheduling, Quality & Estimation

Facts

> Software, Hardware, database, Project, People, Team leader, Stakeholders, Model, Analysis, Design, Test, Risk, Quality, Estimation.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Overview of Software Engineering & the Software Development Process** 1.1 The evolving role of Software & changing nature of software-Definition of a Software, Characteristics of a Software, Categories of Software 1.2 Software Engineering –A layered Technology approach(Definition of Software Engineering, Need of Software Engineering 1.3 The software development process-Generic Framework activities, Umbrella activities 1.3.1 The Capability Maturity Model Integration Model(CMMI)-levels and their significance, process areas considered for CMMI Level 1.4 PSP and TSP 1.4.1 Significance in Ongoing Software Process Improvement 1.4.2 Goals 1.4.3 Names of the PSP and TSP framework activities and their meaning 1.5 Prescriptive Process Models 1.5.1 The Waterfall Model - Nature, Situations in which applicable with example, Associated problems 1.5.2 The Incremental Model - Incremental Model (Nature, Situations in which applicable with example, General steps) - RAD Model (Nature, Situations in which applicable with example, General steps, Drawbacks) 1.5.3 The Evolutionary Process Model - Prototyping (Nature, Situations in which applicable with example, General steps, Drawbacks) - Spiral Model (Nature, Situations in which applicable with example, General steps, Advantages, Drawbacks)	08	20
02	**Software Engineering Requirements and Development of Analysis & Design Models.** 2.1 Software Engineering Practice 2.1.1 Definition 2.1.2 Importance 2.1.3 Essence 2.2 Core Principles of Software Engineering (Statement and Meaning of each Principle) 2.3 Communication Practices (Meaning of Communication, Communication Principles - Statement and Meaning of each) 2.4 Planning Practices	16	24

(Meaning of Software Planning, Basic Activities included, Planning Principles - Statement and Meaning of each)

2.5 Modeling Practices
- Meaning of Software Modeling
- Analysis Modeling
(Meaning, Names of the analysis domains represented, Analysis Modeling Principles - Statement and Meaning of each)
- Design Modeling
(Meaning, Names of the three Design aspects , Design Modeling Principles - Statement and Meaning of each)

2.6 Construction Practices
- Meaning of Software Construction
- Coding
(Meaning, Preparation Principles, Coding Principles, Validation Principles)
- Testing
(Meaning, Testing Principles - Statement and Meaning of each)

2.7 Software Deployment
- Meaning of Delivery Cycle, Support Cycle and Feedback Cycle
- Deployment Principles (Statement and Meaning of each)

2.8 Requirements Engineering(RE)
2.8.1 Meaning of RE
2.8.2 Need of RE
2.8.3 RE Tasks
(Meaning and Sub-tasks included)

2.9 Analysis Modeling
2.9.1 Objectives
2.9.2 Analysis Rules of Thumb
2.9.3 Domain Analysis
- Meaning
- Examples of Domain
- Goal
- Input and Output of Domain Analysis
2.9.4 Analysis Modeling Approaches
- Structured Analysis (Meaning)
- Object-oriented Analysis (Meaning)
2.9.5 Building the Analysis Model
- Data Modeling Concepts
(Meaning of the terms – data objects, data relationships, data attributes, cardinality and modality with example)
- DFD
(Use, Standard Notations, Rules followed, DFD construction using any Case study)
- Data Dictionary(DD)
(Meaning, Use, Contents incorporated, Advantages)

5

	- Creating a Control Flow Model (Nature of Software Applications where required, Use, Guidelines used) - Creating Control Specifications(CSPEC) (Use, State diagram and Program activation table – meaning and use) - Creating Process Specification(PSPEC) (Use, Names of the contents it includes) - Creating a Behavioral Model (Use, General steps) 2.10 Design Engineering/Modeling 2.10.1 The Design Process (Meaning of Software Design, Three Characteristics of good design) 2.10.2 Design Quality Guidelines 2.10.3 Design Concepts - Abstraction, Architecture, Patterns, Modularity, Information hiding, Functional independence, Refinement, Refactoring, Design classes (Meaning and Importance with respect to ease of design, development, testing, and debugging) 2.10.4 The Design Model - Data design elements, Architectural design elements, Interface design elements, Component-level design elements, Deployment-level design elements (meaning and inputs from analysis modeling that help in their creation)		

03	**Testing Strategies & Methods.**
	3.1 Software Testing Fundamentals
	3.1.1 Definition of Software testing
	3.1.2 Meaning of good test
	3.1.3 Meaning of successful test
	3.1.4 Meaning of testing strategy
	3.1.5 Meaning of test plan, test cases, test data
	3.1.6 Characteristics of Testing Strategies
	3.2 Software Verification and Validation(V&V)
	- Meaning, Differences, Names of the set of SQA Activities involved in V&V
	3.3 Testing Strategies for Conventional Softwares
	3.3.1 Unit Testing
	- Meaning
	- Aspects of the Software Program tested
	3.3.2 Integration Testing
	- Meaning
	- Approaches
	    • Top-down integration
	    (Meaning, Steps involved)
	    • Bottom-up integration
	    (Meaning, Steps involved)
	    • Regression testing
	    (Meaning, Purpose)
		08	20

		• Smoke testing (Meaning, Purpose) 3.4 Alpha and Beta Testing - Meaning - Purpose - Differences 3.5 System Testing 3.5.1 Meaning and Purpose 3.5.2 Types - Recovery testing, security testing, Stress testing, Performance Testing (Meaning, Purpose with example) 3.6 White-box and Black-box Testing (Meaning and Purpose) Debugging 3.6.1 Meaning 3.6.2 Outcomes 3.6.3 Characteristics of Bugs 3.6.4 Debugging Strategies - Brute force, Backtracking, Cause elimination, Automated debugging (Meaning)		
04		**Software Project Management** 4.1 What is Software Project Management and Why is it needed? 4.2 The Management Spectrum – The four Ps - the People, the Product , the Process, & the Project (Meaning and Significance of each 'P') 4.3 Project Scheduling and Tracking 4.3.1 Meaning of project scheduling and tracking 4.3.2 Need 4.3.3 What must a project schedule indicate? 4.3.4 Reasons why project deadlines cannot be met 4.3.5 Basic Principles used for project scheduling (Meaning of each principle) 4.3.6 Introduction to the Scheduling Techniques/Methods - PERT, CPM, Timeline Charts 4.3.7 Ways in which the project schedule can be tracked (Only a list of the ways) 4.4 Risk Management 4.4.1 Meaning of Software Risk 4.4.2 Reactive Vs Proactive risk strategies - Meaning of Reactive risk strategy - Meaning of Proactive risk strategy - Names of the steps involved in formulation of the Proactive risk strategy 4.4.3 Types of Software Risks - Names and Meaning of the risks 4.4.4 The RMMM Strategy - The names of the issues involved - Possible steps to mitigate risks	10	18

7

		- List of the factors to be monitored
		- The RMM Plan (Meaning and what it includes)
		4.5 Change Management
		    4.5.1 Meaning of SCM
		    4.5.2 Need of SCM
		    4.5.3 SCM Features
		        (Names and meaning of the features)
		4.6 Cleanroom Software Egineering
		    4.6.1 The Cleanroom approach
		    4.6.2 The Cleanroom Strategy
		        (Names and meaning of the tasks involved)
		        The Cleanroom difference		

05		**Software Quality Management& Estimation**
		5.1 Basic Quality Concepts.
		5.2 Software Quality Assurance(SQA)
		    - Definition of SQA
		    - Activities carried out by the SQA Group
		5.3 Introduction to Statistical SQA
		    (Meaning and list of the activities involved)
		5.4 Six Sigma Strategy for Software
		    - Meaning
		    - Core Steps (The DMAIC Method)
		5.5 The ISO 9000 Quality Standards
		    - ISO's definition of Quality
		    - ISO 9001:2000 Software Quality Focus
		5.6 Software Reliability and Software Availability
		    - Definition
		    - Units of measurement
		5.7 McCall's Quality Factors
		    (Names and meaning of each factor)
		    Estimation
		5.7.1 Meaning of Software Estimation
		5.7.2 List of the steps involved
		5.7.3 Types of Decomposition Techniques
		    (Names and meaning of the techniques)
		5.7.4 Software Sizing
		    - Meaning
		    - Approaches (names and meaning of the approaches)
		5.7.5 COCOMO II Model
		     Meaning,Use (applications)
			06	18

		Total	**48**	**100**

Learning Resources:

1. Books

Sr .No.	Author	Title	Publication
1.	Roger S. Pressman	Software Engineering –A Practitioner's Approach	Tata McGraw Hill Publication
2.	Richard Fairley	Software Engineering Concepts	Tata McGraw Hill Publication
2.	Waman S. Jawadekar	Software Engineering – Principles and Practice	Tata McGraw Hill Publication

2. Websites

1) www.sei.emu.edu
2) www.ieee.org
3) www.ifpug.org
4) www.microsoft.com/office/visio
5) www.rational.com/UML
6) www.qaiusa.com
7) www.iso90001compliance.com
7) www.iso90001compliance.com

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester   : Fifth for CO/CM/IF and Sixth for CD

Subject Title : Java Programming

Subject Code : 12176

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 SBTE.**

> ➢ **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:

Java language enhances and refines the object oriented paradigm. Essential to adapt to refinements and improvements in the art of programming. Java supports development of dynamic network based applications, which are secured, reliable, portable, extensible and reusable. This subject knowledge is essential for development of customized and web based applications. Java being platform independent language and a freeware software, the major business applications world wide being based on Java technology, learning Java becomes essential.

Further this subject, which includes learning core java forms a foundation for learning Advanced java.

Objective:

The student will be able to:

1. Design and implement classes and methods

2. Understand and implement basic programming constructs

3. Apply object oriented features to real time entities

4. Differentiate between primitive data types and class data types and implement

    conversion between them.

5. Understand and implement the concept of reusability and extensibility

6. Create packages and interfaces and used it in programs

7. Design and implement multithreaded programs

8. Manage errors and exceptions

9. Design and implement applet and graphics programming

10. Make use of Data streams in programs

11. Write programs by combining all features of Java.

Learning Structure:

Applicatio	Designing and implementing application programs, applet programs and respective classes. Apply Knowledge for developing reliable, efficient, customized and downloadable web applications

Procedure	Designing classes, members, Interfaces, and Coding	Debugging, Implement error and exception Handling	Implementation of Threading	Design and implement Applet Programs

Principles and Concepts	Data Handling & Encapsulation Abstraction: Representation of essential facts	Function Overriding and Overloading, Dynamic Binding	Predefined errors and Exceptions	Concurrent Processing	Applet Programming and Graphics Class

Facts	Syntax and Semantic, Basic programming constructs, Object Oriented Paradigm	Error and Error Types	Multiprocessing	Applet Syntax and Semantics Graphics Fundamentals

11

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction to Java** 1.1 Fundamentals of Object Oriented Programming Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding 1.2 Java Features Compiled and Interpreted, Platform independent and portable, Object oriented Distributed, Multithreaded and interactive, High performance 1.3 Constant, Variables and Data Types Constant, Data Types, Scope of variable, Symbolic Constant, Type casting, Standard default values 1.4 Operator and Expression Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operator Increment and Decrement Operator, Conditional Operator, Bit wise Operator, Special Operator 1.5 Decision making and Branching Decision making with if statement, Simple if statement, The if else statement, The else if ladder, The switch statement, The? : Operator 1.6 Decision making and Looping The While statement, The do statement, The for statement, Jumps in Loops (Break , Continue)	10	20
02	2.1 Classes, Object and Methods Defining a class, Creating object, Accessing class members, Constructor, Methods Overloading, Static Member 2.2 Inheritance Extending a Class (Defining a subclass Constructor, Multilevel inheritance, Hierarchical inheritance, Overriding Methods, Final variable and Methods, Final Classes, Abstract method and Classes 2.3 Visibility Control Public access, friend access, Protected access, Private access, Private Protected access 2.4 Array, Strings and Vectors Arrays, One Dimensional array, Creating an array, Two Dimensional array, Strings (String and StringBuffer class), Vectors, Wrapper Classes	08	24
03	**Interfaces and Packages** 3.1 Interface: Multiple Inheritance Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variable 3.2 Packages: Putting Classes Together System Package, Using system Package, Naming Convention, Creating Package, Accessing a package, Using a package, adding a class to a package	06	16
04	**Multithreaded Programming and Exception handling** 4.1 Multi Threading: Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread method, Thread exceptions, Thread priority, Synchronization, Implementing a	08	20

	'Runnable'' Interface 4.2 Managing Errors and Exceptions Types of errors, Exception, Multiple catch statement, using throw, throws and finally statement, Using Exception for Debugging		
05	**Java Applets and Graphics Programming** 5.1 Applet Programming Applet basics, Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet 5.2 Graphics Programming The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts	10	16
06	**Streams and File I/O** 6.1 Stream Classes 6.2 Character Stream, Byte Stream (Reading And Writing Streams) 6.3 Serialization	06	04
	Total	48	100

Practical:

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.

Sr. No.	List of Practicals
1.	Write simple programs based on basic syntactical constructs of Java like: a) Operators and expressions. b) Looping statements. c) Decision making statements. d) Type casting.
2.	Write a simple Java program to demonstrate use of command line arguments in Java..
3.	Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object
4.	Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object
5.	Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.
6.	Write a Java Program to demonstrate use of sub class
7.	Write a Java Program to demonstrate use of nested class.
8.	Write a Java Program to practice - use of single Dimensional array. - use of multidimensional array.
9.	Write a Java Program to implement array of objects.
10.	Write a Java program to practice - using String class and its methods. - using String Buffer class and its methods.
11.	Write a Java Program to implement Vector class and its methods.
12.	Write a Java Program to implement Wrapper classes and their methods.
13.	Write a Java Program to implement single inheritance by applying various access controls to its data members and methods.
14.	Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
15.	Write a Java Program to implement inheritance and demonstrate use of method overriding.
16.	Write a program to demonstrate - use of implementing interfaces. - use of extending interfaces.
17.	Write a Java program to implement the concept of importing classes from user defined package and creating packages.
18.	Write a program to implement the concept of threading.
19.	Write a program to implement the concept of Exception Handling - using predefined exception. - by creating user defined exceptions.
20.	Write a program to implement the concept of Synchronization for - object synchronization. - method synchronization.
21.	Write a program using Applet - to display a message in the Applet. - for configuring Applets by passing parameters.
22.	Write programs for using Graphics class - to display basic shapes and fill them. - draw different items using basic shapes - set background and foreground colors.
23.	Write program to demonstrate use of I/O streams.
24.	Write program to demonstrate use of File streams.

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publisher
01	E. Balagurusamy	Programming with Java	BPB
02	C Thomas WU	An Introduction to Object Oriented Programming	Tata McGraw Hill
03	Patrick Naughton-Herbert Schildt	The Complete Reference Java 2 (Third Edition)	Tata McGraw Hill
04	John R.Hubbard	Programming with Java	Tata McGraw Hill
05	Cohoon & Davidson	Java Program design	Tata McGraw Hill
06	Jawroski	Java2 Unleashed	Techmedia
07	Java2 Programming	Keyur Shah	Tata McGraw Hill

Notes: LCD has to be used for effective learning for all the topics.

2) Web Sites:

       http://www.sun.java.com

       http://www.osborne.com

       http://www.sun.java.com (For downloading JDK for Practical)

Course Name : Diploma in Computer Engineering / Computer Technology

Course Code : CO/CM/CD

Semester　　　: Fifth for CO/CM/IF and Sixth for CD

Subject Title : Computer Security

Subject Code : 12177

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

> **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**

> **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:

　　Computer security, one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's systems. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats. The student will achieve a firm intuition about what computer security means, be able to recognize potential threats to confidentiality, integrity and availability.
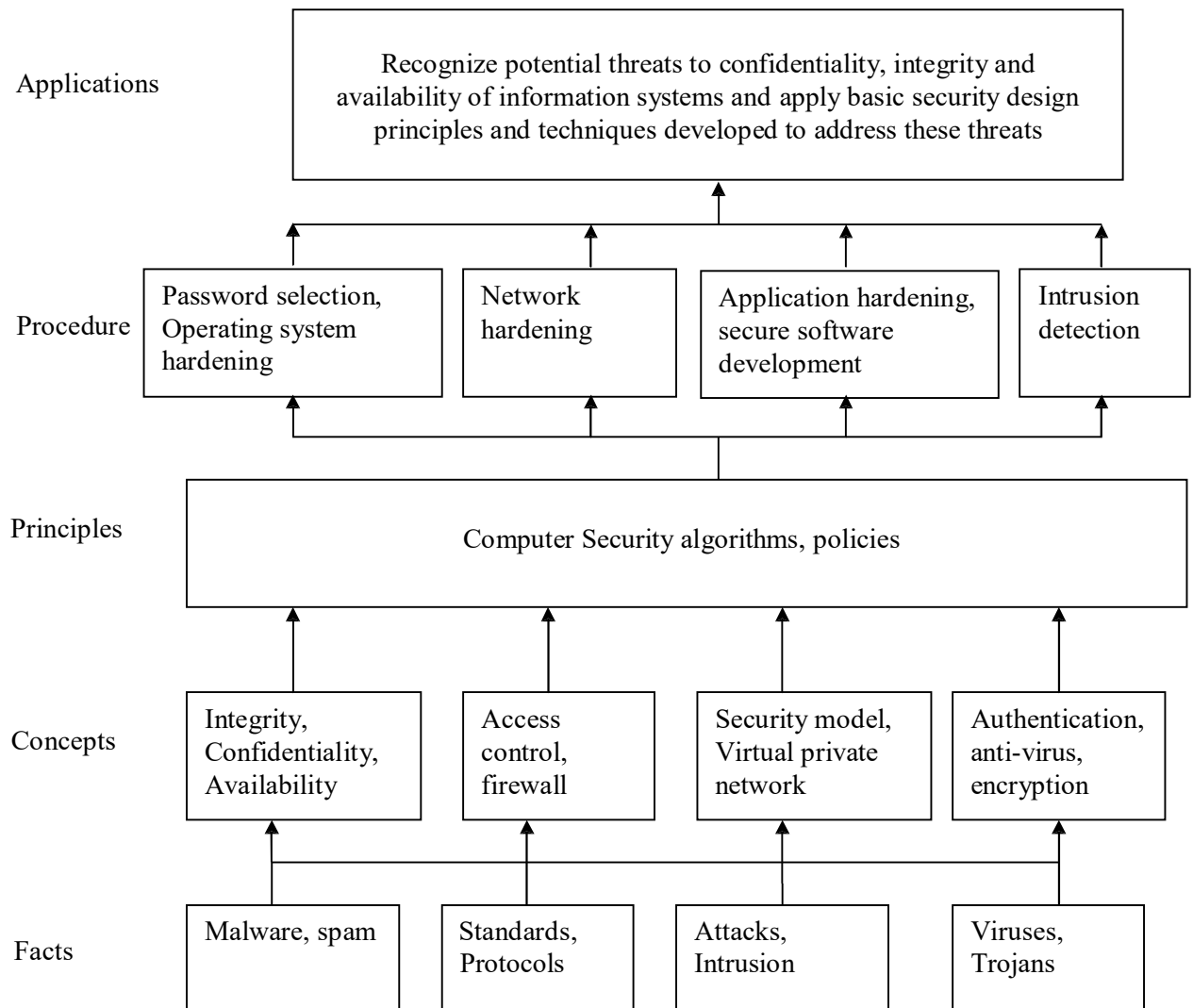
　　This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks, security mechanisms, operating system security, secure systems design principles, and network security principles. It will develop knowledge for security of information and information systems within organizations. It focuses on concepts and methods associated with planning, managing, and auditing security at all levels including networks

Objectives:
The students will be able to:
1. Understand the risks faced by Computer Systems and the nature of common Information hazards.
2. Identify the potential threats to confidentiality, integrity and availability of Computer Systems.
3. Understand the working of standard security mechanisms.
4. Use cryptography algorithms and protocols to achieve Computer Security.
5. Understand the threats and security mechanisms for Computer Networks.
6. Build systems that are more secure against attacks.
7. Apply security principles to secure Operating Systems and applications.

Learning Structure:

Applications	Recognize potential threats to confidentiality, integrity and availability of information systems and apply basic security design principles and techniques developed to address these threats
Procedure	Password selection, Operating system hardening / Network hardening / Application hardening, secure software development / Intrusion detection
Principles	Computer Security algorithms, policies
Concepts	Integrity, Confidentiality, Availability / Access control, firewall / Security model, Virtual private network / Authentication, anti-virus, encryption
Facts	Malware, spam / Standards, Protocols / Attacks, Intrusion / Viruses, Trojans

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction and Security trends** 1.1 Need for security, Security basics : Confidentiality, Integrity, Availability, Authentication, Access Control 1.2 Threats to security : Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, steps in attack 1.3 Types of attack: Active and Passive attacks, Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. Malware : Viruses, Logic bombs	06	16
02	**Organizational/ Operational security** 2.1 Role of people in security : Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software / hardware, Access by non employees, Security awareness, Individual user responsibilities 2.2 Physical security : Access controls Biometrics : finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes, Physical barriers 2.3 Network security basics, model for network security	06	16
03	**Cryptography and Public key Infrastructure** 3.1 Introduction : Cryptography, Cryptanalysis, Cryptology, Substitution techniques : Caesar's cipher, monoalphabetic and polyalphabetic, Transposition techniques – Rail fence technique, simple columnar, Steganography 3.2 Hashing - concept 3.3 Symmetric and asymmetric cryptography : Introduction Symmetric encryption : DES (Data encryption standard) algorithm, Diffie-Hellman algorithm, Problem of key distribution, Asymmetric key cryptography : Digital Signature, Key escrow 3.4 Public key infrastructures : basics, digital certificates, certificate authorities, registration authorities, steps for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate 3.5 Trust models : Hierarchical, peer to peer, hybrid	14	20
04	**Network security** 4.1 Firewalls : concept, design principles, limitations, trusted systems, Kerberos - concept 4.2 Security topologies – security zones, DMZ, Internet, Intranet, VLAN, security implication, tunneling	08	16

	4.3 IP security : overview, architecture, IPSec, IPSec configurations, IPSec security 4.4 Virtual Private Network 4.5 Email security : Email security standards : Working principle of SMTP, PEM, PGP, S/MIME, spam,		
05	**System security** 5.1 Intruders, Intrusion detection systems (IDS), host based IDS, network based IDS 5.2 Password Management, vulnerability of password, password selection strategies, components of a good password 5.3 Operating system security : Operating system hardening, general steps for securing windows operating system, Hardening Unix/Linux based operating system, updates : hot fix, patch, service pack	08	16
06	**Application and web security** 6.1 Application hardening, application patches, web servers, active directory 6.2 Web security threats, web traffic security approaches, secure socket layer and transport layer security, secure electronic transaction Software development : secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing	06	16
	Total	**48**	**100**

Learning Resources:

Books:

Sr. No.	Author	Title	Publication
01	Atul Kahate	Cryptography and Network Security	Tata-McGraw-Hill Sixth reprint 2006
02	William Stallings	Cryptography and Network Security Principles and Practices	Pearson Education, Third Edition
03	Dieter Gollman	Computer Security	Wiley India Education, Second Edition
04	Deborah Russell G.T.Gangenisr	Computer Security Basics	O'Reilly publication
05	Wm. Arthur Conkin Dwayne Williams Gregory B. White Roger L. Davis Chuck Cothren	Principles of Computer Security Security + and Beyond	Mc Graw Hill Technology Education International Edition 2005

Web site links:

1. **http://www.pgpi.org/doc/pgpintro/**

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester   : Fifth for CO/CM/IF and Sixth for CD

Subject Title : Operating System

Subject Code : 12178

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 SBTE.**
> ➢ 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:

To meet the ever increasing need of computers, networks and internet study of operating system is compulsory. Operating system is the interface between the user and the computer system .It is the first piece of software to run on a computer system when it is booted .Its job is to co-ordinate and provide services for the execution of application software. This is core technology subject and the knowledge of which is absolutely essential for Computer Engineers .It familiarizes the students with the concepts and functions of operating system. This subject provides knowledge to develop systems using advanced operating system concepts.

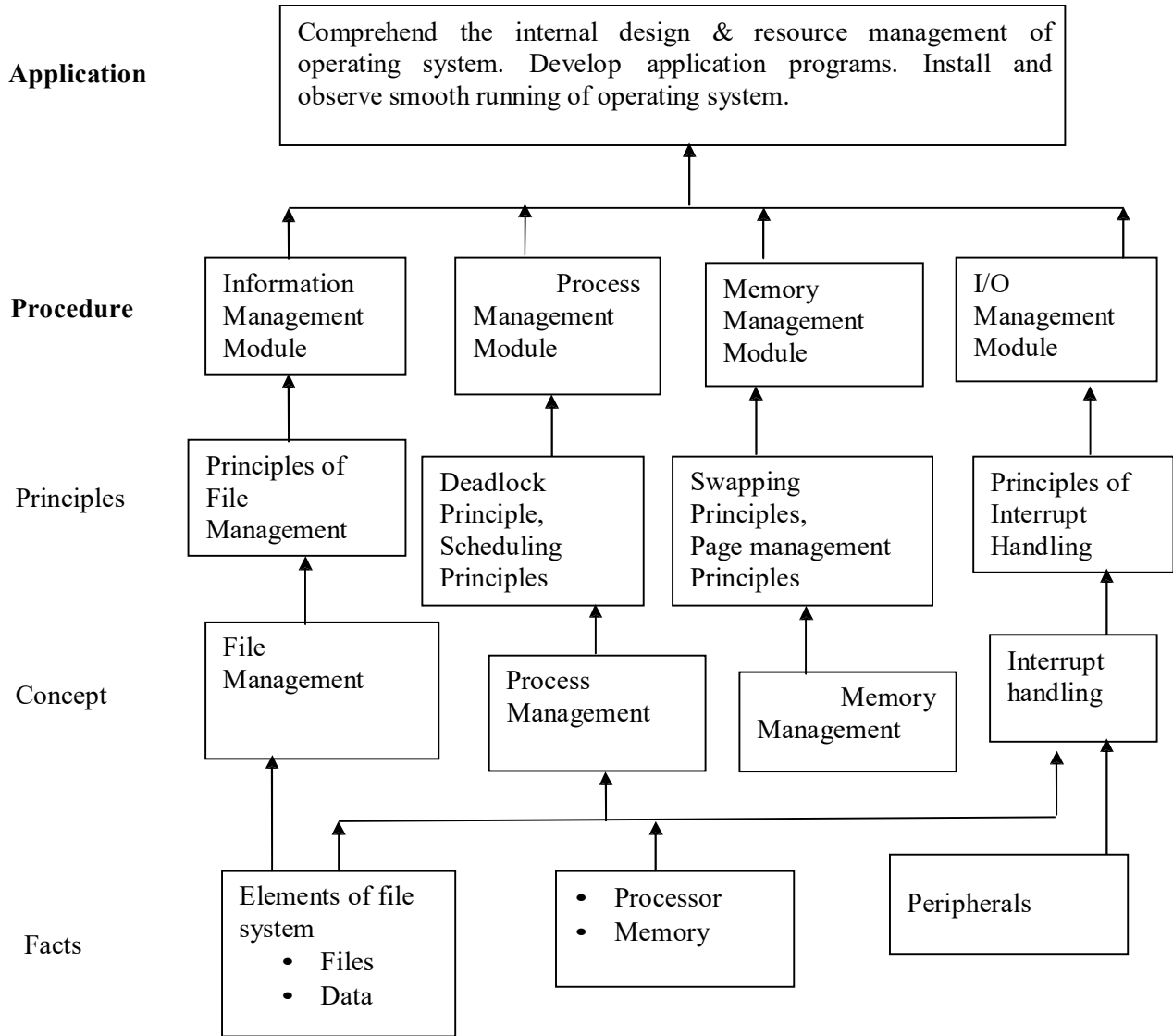This subject gives overview of Unix operating system as a case study.

Objectives:
Student will be able to:
1. Learn the various milestones in the history of operating system and the modern trends in operating system.
2. Understand the features and functions of operating systems provided by various system calls.
3. Understand a process, deadlock & the concept of context switching & multiprogramming.
4. Learn various memory management and file management techniques.
   a. Understand the tools and the components of the operating system.
5. Implement various algorithms of scheduling.
6. Compare and contrast the various standard solutions to operating system problems.

7. Make best use of facilities that computer system offer them for solving problems.

8. Understand the Unix vi editor and Unix utilities.

9. Lean the concept of shell programming and develop programs on it.

Learning Structure:

Application

> Comprehend the internal design & resource management of operating system. Develop application programs. Install and observe smooth running of operating system.

Procedure

| Information Management Module | Process Management Module | Memory Management Module | I/O Management Module |

Principles

| Principles of File Management | Deadlock Principle, Scheduling Principles | Swapping Principles, Page management Principles | Principles of Interrupt Handling |

Concept

| File Management | Process Management | Memory Management | Interrupt handling |

Facts

| Elements of file system
 • Files
 • Data | • Processor
 • Memory | Peripherals |

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Introduction** 1.1 Operating system, Evolution, Generations –1st, 2nd, 3rd, 4th. 1.2 Mainframe Systems – Batch, Multi programmed, Multitasking, Time sharing, Desktop. 1.3 Multiprocessor Systems 1.4 Distributed Systems. 1.5 Clustered Systems. 1.6 Real Time Systems. 1.7 Recent Operating System Characteristic –XP,WIN-07	04	12
02	**Operating System Structures** 2.1 System components activities - Process management, Main memory management, File management, I/O system management, Secondary storage management. 2.2 Operating system services. 2.3 System calls – Uses, process control, file management, Device management, Information maintenance, communication. 2.4 Operating system structure. Simple structure, layered, monolithic, microkernel. 2.5 Booting	10	20
03	**Process Management** 3.1 Processes - Concept, process, state, process control block. 3.2 Process scheduling - Scheduling queues, scheduler, context switch. 3.3 Operations on processes - creation, termination. 3.4 Inter process communication. 3.5 Threads - Benefits, user and kernel threads. 3.6 Multithreading Models - Many to one, one to one, many to many.	10	22

04	**Scheduling**
	4.1 Scheduling –
	    Objectives, concept, criteria, CPU and I/O burst cycle.
	4.2 Types of Scheduling-Pre-emptive, Non pre- emptive.
	4.3 Scheduling Algorithms.
	    First come first served (FCFS), Shortest job first (SJF), Round Robin (RR), Priority.
	4.4 Other Scheduling.
	    Multilevel, Multiprocessor, real-time.
	4.5 Deadlock.
	   System model, principle necessary conditions, mutual exclusion, critical region.
	4.6 Deadlock handling.
	    Prevention, avoidance algorithm-Bankar's algorithm, Safty algorithm
		12	22

05	**File System and Memory Management** 5.1 File- Concept, Attributes, Operations, Types, Structure 5.2 Access Methods – Sequential, Direct. 5.3 Swapping 5.4 Allocation Methods – Contiguous, Linked, Indexed. 5.5 Directory Structure – Single level, Two level, Tree Structure.	12	24

	5.6 Protection –Types of accesses, Access control.
	5.7 Basic Memory Management –Partitioning, Fixed & Variable.
	5.8 Free Space management techniques –Bitmap, Linked List.
	5.9 Virtual Memory – Concept, Paging, Page fault, Page Table.
	5.10 Page Replacement algorithms – FIFO(First in First out),
	      Optimal Page replacement, LRU (Least recently used), NRU
	      (Not recently used)		

	Total	**48**	**100**

Practical:
Skills to be developed:

Intellectual skills:
> Understanding syntax of commands
> Interpretation of commands
> Execution of commands
> .

Motor skills:
- Proper handling of Computer System**.**

List of Practical:
Identify the major desktop components, interfaces and their functions .Differentiate the various Windows Operating system.(Windows 9x,Windows NT, Windows 2000& Windows XP.

1) Use of file and directory manipulation commands – ls, rm, mv, cp, join, split, cat, head, tail, touch, diff, comm., pr, chmod, mkdir, rmdir, cd, pwd, dir, cmp.
2) Use of text processing and communication commands – tr, wc, cut, paste, spell, sort, grep, mesg, talk, wall, write, who, who am i ,news, mail.
3) Use of general purpose and process commands- ps, wait, sleep, exit, kill, bc, date, time, cal, clear, banner, tty, script, su, man.
4) Use of vi editor & perform all editor commands.
5) Write and execute shell script to display the following output.
   i) Menu:
      a) List of files.
      b) Processes of user.
      c) Todays date
      d) Users of the system
      e) Quit to Unix
   ii) To check every argument and carry out the following.
      a) Argument is a directory, then display the number of files and directories present in that directory.
      b) If argument is a file, then display the size of file.
      c) If argument does not exist then create the directory.
7) Write and execute the programme to implement round robin scheduling Algorithm.

Learning Resources:

1. Books:

Sr.No.	Author	Title	Publication
01	Silberschatz Galvin, Gagne	Operating System Concepts	John Wiley & Sons (Asia) Pte ltd.
02	Achyut S. Godbole	Opearating Systems	Tata McGraw-Hill
03	Andrew S. Tanenbaum	Modern Opearating Systems	Prentice Hall of India
04	Sumitabha Das	Unix Concepts and Applications	Tata McGraw-Hill
05	Murugan Sethuraman	Unix Concepts and Programming	Denett & Co.
06	Yashwant Kanetkar	Unix Shell Programming	BPB Publication

2. Websites
1. www.denett.com
2. www.tatamcgrawhill.com
3. www.phindia.com
4. www.wiley.com/college/silberschatz6e/0471417432/slides/ppt
5. www.en.wikipedia.org
6. www.computerworld.com
7. www.computer.howstuffworks.com
8. www.willamstallings.com/os4e.html
9. www.deitel.com/books/os3e/slides.html

Course Name	**: Diploma in Computer Technology**
Course Code	**: CM**
Semester	**: Fifth**
Subject Title	**: Data Base Management (Elective-I)**
Subject Code	**: 12179**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	--	--	25@	125

NOTE:

- ➢ **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**
- ➢ **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)**
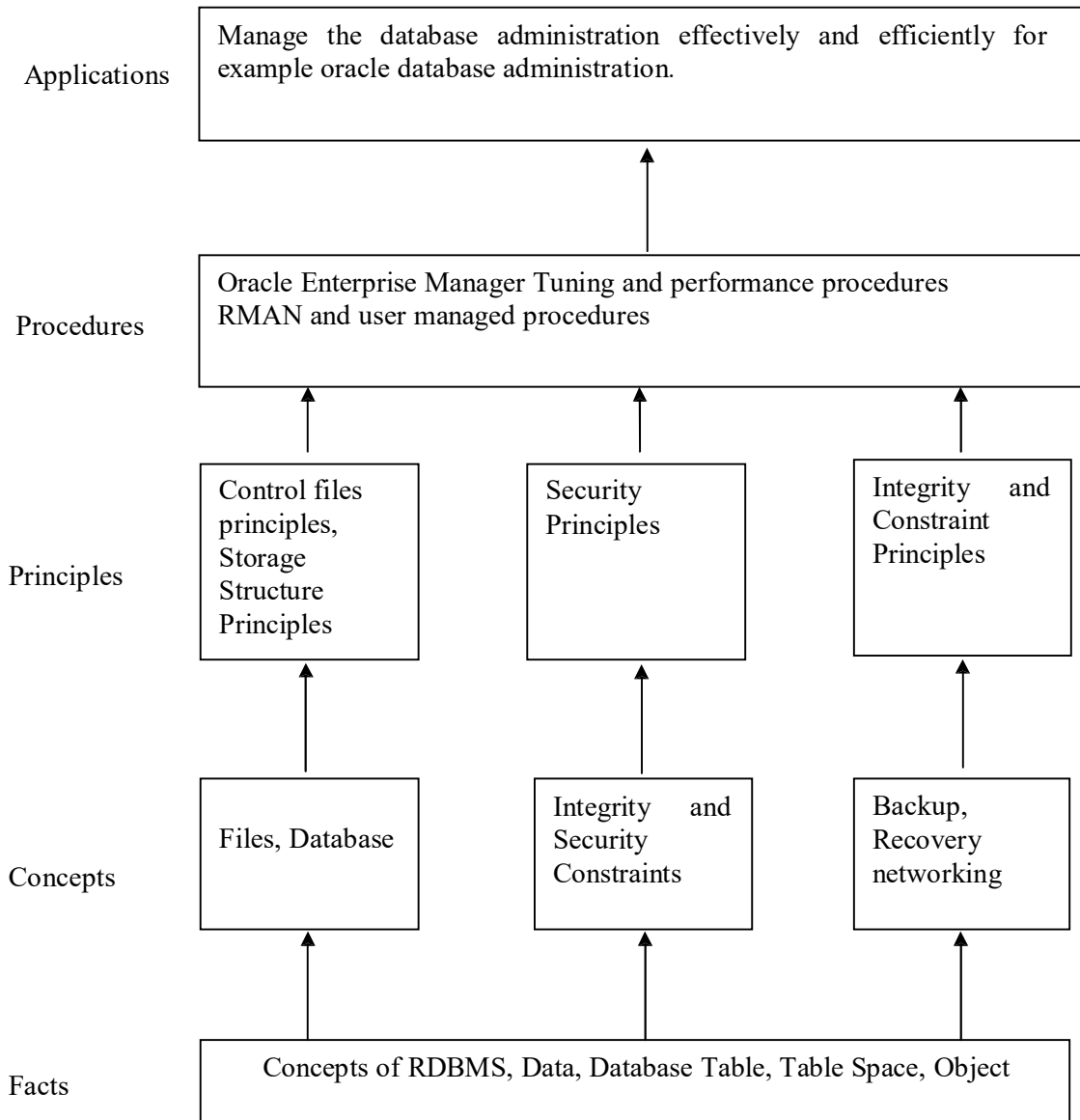
Rationale:

In the present era it is very essential to develop and arrange data in such a way that it sales a complex problem efficiently. Data base administration is a subject which emphasis make on managing the data and this duty is performed by the database administrator (DBA). The position of DBA in the IT industry is important since it deals with critical issues of design and management of database in a comprehensive manner. After studying this subject the student will be able to handle data collection and management of data and transformation in a secure environment. The student will also be able to set up the network configuration between the database clients and servers, reform backup and recovery.

Objectives:

Student will be able to:

1) Describe the oracle architecture.
2) Create and manage redo & Control files.
3) Create and manage user, roles, previteges tables, table spaces, indexes and integrity constraints.
4) Apply the concept of backup and recovery using user managed and RMAN.
5) Use oracle to manage networking tasks.
6) Apply tuning concepts to improve the performance.

Learning Structure:

Applications	Manage the database administration effectively and efficiently for example oracle database administration.

↑

Procedures	Oracle Enterprise Manager Tuning and performance procedures RMAN and user managed procedures

↑

Principles	Control files principles, Storage Structure Principles	Security Principles	Integrity and Constraint Principles

↑

Concepts	Files, Database	Integrity and Security Constraints	Backup, Recovery networking

↑

Facts	Concepts of RDBMS, Data, Database Table, Table Space, Object

Contents:- Theory

Chapter	Name of the Topic	Hours	Marks
01	**Oracle Architecture.** 1.1 Components of Oracle Architecture. Structures for connecting a user to an oracle Instance, Common database administrative tools for DBA, features of the oracle universal Installer, Optimal flexible architecture, Setting of Password file authentication, main components of oracle enterprise manager and their uses. 1.2 Maintaining Control file. Use of control file, Control file, Multiplex and manage the control file, manage control file with oracle managed files. 1.3 Managing an Oracle Instance. Create and manage Initialization parameter files, configure OMF, startup & shutdown an instance, monitor the use of diagnostic files 1.4 Creating a Database. Prerequisite for database creation, creating a database using oracle database configuring assistant, Creating a database manually 1.5 Maintaining redo log files. Purpose & structure of online redo log files, Control lock switches and check points, Multiplex and maintain online redo log files, Manage online redo log files with OMF.	08	20

02	**Managing Users, Role and Database Objects.**
	
	2.1 Managing users, privileges and roles.
	  Creating new database users alter and drop existing database users, Monitor information about existing users, Identify system and object privileges, grant and revoke privileges, identify auditing capabilities, create and modify roles, Control availability of roles, remove roles, user predefined roles, display role information from the data dictionary.
	2.2 Managing table spaces.
	  Manageing table spaces, data files, tables, undo data and indexes logical structure of table spaces within the database, create table spaces, change the size of the table space allocate table space for temporary segments, Chage the status of table spaces, change the storage setting of table spaces, implement oracle managed files, various methods of storing data, oracle data tupes, distinguish between an extended versus a restricted row id, structure of a row, creating regular and temporary tebles, manage storage structures within a table, reorganize truncate, drop a table, purpose of undo data, automatic undo management different types of indexes and their uses creating, reorganizing and dropping indexes, get index information from the data dictionary.
	2.3 Storage structure and relationships
	  Logical structure of segments, segment types and uses, keywords that control block spaces usage, get information about storage structures from the data dictionary.
	2.4 Data dictionary content and usage
	  Data dictionary components, contents and uses of data dictionary, query the data dictionary.
	2.5 Managing password security, resources and data integrity,
	  Manage passwords using profiles, administrator profiles, control use of resources using profile, implement data integrity constraints, maintain integrity constraints, obtain constraint information from the data dictionary.
		08	20

03	**Oracle Backup and Recovery** 3.1 • Backup and recovery overview. Basics of database backup, restore and recovery, types of failure in an oracle environment, backup and recovery strategy. • Instance and media recovery structures. Oracle processes, memory structures and files related to recovery, importance of check points, redo log files and archived log files, instance recovery. • Configuring the database archiving mode Difference between archive log and no archive log modes; configure a database for archive log mode, automatic archiving, multiple archiving processes. 3.2 • Oracle recovery manager overview and configuration. RMAN features, components, configuring RMAN. • User managed backups and RMAN backups. User managed backups and recovery operations, backup issues with read table spaces, perform closed and open database backups, backup the control file, cleanup after a failed online backup, DB verify utility to detect corruption, types of RMAN specific backups backing up with RMAN, copy command to create image copies. • User managed complete recovery and RMAN complete recovery. Recovery in non archive log mode and complete recovery in archive log mode using user managed and RMAN, restore data files to different locations, relocate and recover a table space by using archived redo log files. • User managed incomplete recovery and RMAN incomplete recovery. Necessity of incomplete recovery, Methods for incomplete recover y, incomplete recovery with user managed backups, incomplete recovery using RMAN and using enterprise manager, recovery of the control file, recovery through reset logs. • RMAN maintenance and recovery catalog creation and maintenance. Cross checking of backups, updating the repository, changing the status of backup and copies, catalog backups made with operating system commands, contents of recovery catalog, creating the recovery catalog and maintaining it by using RMAN commands, using RMAN to register, resynchronize and reset a database, querying recovery catalog to generate reports and lists, create, store and run scripts.	14	24

04	**Oracle Networking** 4.1 Networking overview and basic oracle net architecture. Managing complex networks, oracle networking add-on solutions, components of oracle net layered architecture, oracle net services role, web client connections through oracle networking. 4.2 Configuring oracle networking. Establishing a session, creating and managing a listener, database registration, the listener control utility, techniques for name resolution, configuring service aliases, advanced connection options, testing oracle net connections. 4.3 Managing shares servers Limitations of dedicated server architecture, shared server architecture, configuring shared server, monitoring the shared server when to use the shared server	12	20
05	**Oracle performance and tunning overview** 5.1 Tuning application design, tuning SQL, tuning memory usage, tuning data access, tuning data manipulation, tuning physical storage, reducing network traffic, using STATSPACK and the automatic work load repository, using STATSPACK, tuning tools, alert log, background trace file, server generated alerts, user trace files.	06	16
	Total	**48**	**100**

Practical:
Skills to be developed:

Intellectual Skills:

    1. Use of proper installation process

Motor Skills:

    1. Use of appropriate steps & Sequence

List of Practical:

1) Demonstration of Installation of Oracle database software
2) Create a database with database configuration assistant.
3) Starting up and shutting down database with SQL and Plus and with database control and viewing parameters with database control.
4) Use enterprise manager to create after and drop a table space.
5) Use enterprise manager to grant system and manage database user.
6) Use enterprise manager to grant system and object privileges.
7) Use enterprise manager to create and manage roles and profiles.

8) Create database objects and constraints using enterprise manager.

9) Create and Us password profiles

10) Create a listener with database control, oracle net service alias and configure dynamic service registration.

11) Configure and verify shared server and configure a client to choose the connection type.

12) Create and undo table space with database control and monitor undo with SQL plus.

13) Detect and resolve log connection.

14) Instance recovery and MTTR to demonstrate the effect of check pointing on MTTR.

15) Multiplex the redo log and translation the database to archive log mode.

16) Run a whole database backup and back up the control file to trace with SQL plus and manage RMAN backups.

17) Recovery the data from loss of control file and multiplex online redo log file. Recovery a lost of multiplexed online log file and recovery the data from loss of non critical data files.

18) Set a listener password with isnrctl and creating a listener for external procedural calls.

19) Configure RMAN.

20) Create backup sets using RMAN and managing backups.

21) Set, view and clean alerts using DBMS_SERVER_ALERT_AMI and database.

22) Perform an incomplete recovery with RMAN, and carrying out control file auto backup and restore.

23) Use the SQL tuning adviser for database management.

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publication
1	-	Oracle Database Log	OCP Certification All in one Exam guide Oracle Pears
2	-	Oracle Database DBA Handbook	Oracle Pears
3	Rama Velpuri	Oracle 9I Database: Fundamentals II exam guide	--

2. WebSites:

1) www.oracle.com/technology /pub/articles/tech_dba.html

2) www.oracle.com/technology /oramag/oracle/03-may/0330cp.html

Course Name : Diploma in Computer Technology / Information Technology

Course Code : CM/IF

Semester   : Fifth

Subject Title : Multimedia and Animation Techniques (Elective- I)

Subject Code : 12180

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04*	03	100	--	--	25@	125

* 2 Sessions of 2 Hrs / Week

NOTE:

> **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**

> **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:

One picture speaks thousand words & animated multimedia picture can speak a lot more. Animation has given a boost to various areas like film production, e-learning & animated web-site etc. This subject will enable the students to implement their creative imagination to produce animated text & images.

It is a practical oriented subject which deals with various fonts, audio & video formats, basic shapes, images to the controls, tools & animation.
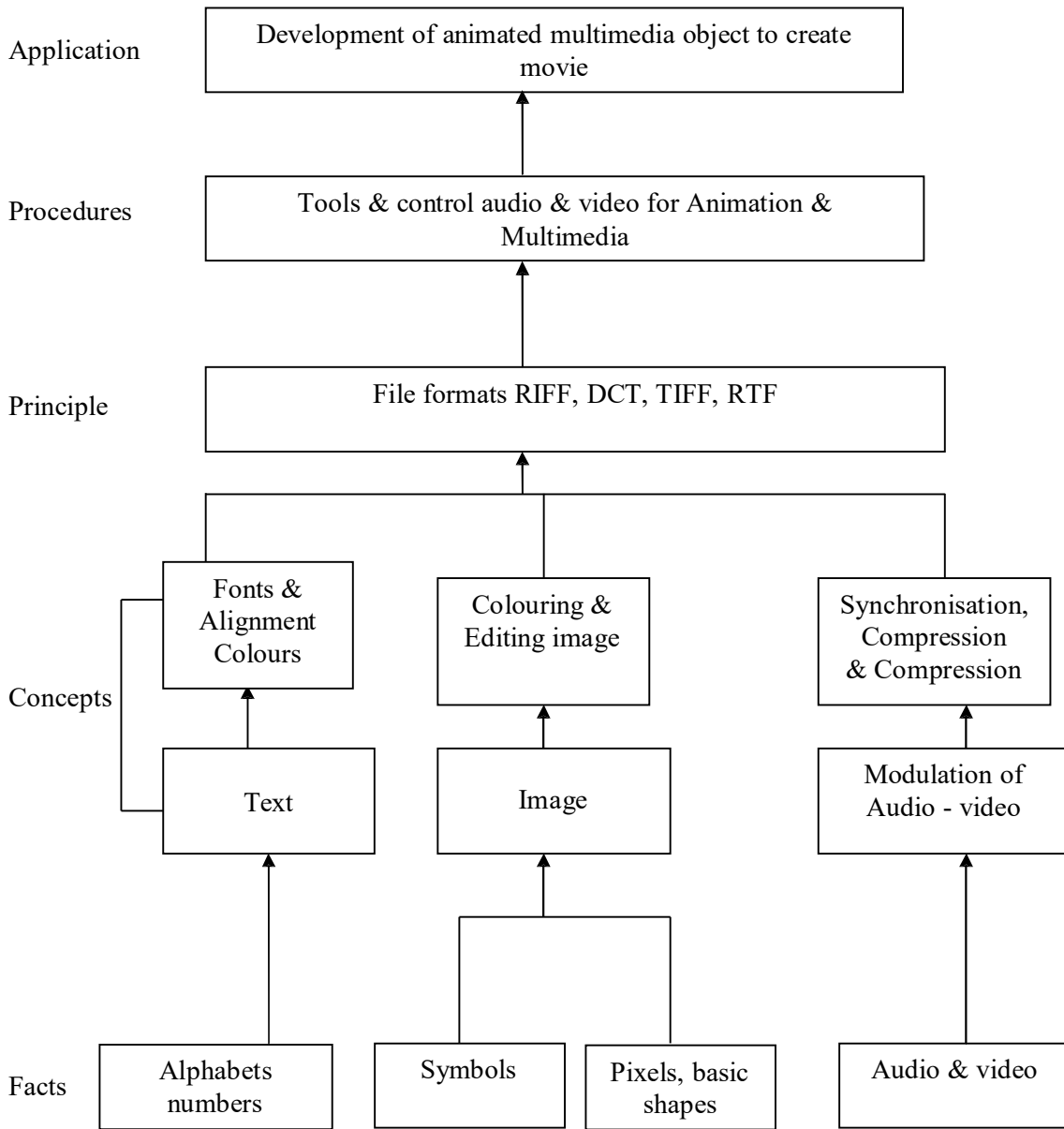
Students will develop the skill for using the basic shapes, text, images apply controls, colours to create final animated multimedia object.

Objectives:

Students will be able to:

1. Import, Export Images.
2. Edit Images.
3. Create Animation.
4. Build Flash Movie.
5. Integrate Audio & Video.
6. Build Text-Based Animation.
7. Play Movie.
8. Integrate Multimedia In Web Page

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 | Text | Colouring & Editing image | Image | Synchronisation, Compression & Compression | Modulation of Audio - video

Facts — Alphabets numbers | Symbols | Pixels, basic shapes | Audio & video

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Multimedia Elements Multimedia Application** **1.1 I/P, O/P devices** 　　Limitations of Traditional Input Device, Digital v/s Analog, Input- Pen-Input, Image Scanner, Charge Coupled Devices, MIDI, Digital Camera, Output, Display System Technology, CRT display System, Display Terminology, Flat Panel Display, Print o/p technology, Dye Sublimation **1.2 Evaluation of Multimedia systems** 　　Multimedia Elements (Fasimile, Document image, photogrphics image, Geographics information system maps, Fullmotion and live video, Holographics images Fractcals). 　　Multimedia Application(Document imaging , Image processing and Image Enchancement, OCR, Handwriting recognition, Non textual Image recognition, Full motion Digital Video application and Electronics messaging). 　　Multimedia System Architecture, Evolving Tech. for Multimedia, Defining Objects for Multimedia Systems, Multimedia Data Interface Standard **1.3 Storage media** 　　Magnetic Media Technology, Hard disk Technology, RAID, Criteria for Selection of RAID, Use of Magnetic Storage in Multimedia, Optical Media, Magneto Optical	08	16
02	**Architecture & Issues For Distributed Multimedia System.** 2.1 Multimedia System Architecture. 2.2 Distributed Multimedia. 2.3 Synchronization, Orchestration & QOS Architecture 2.4 Framework for Multimedia System.	08	16
	Compression/Decompression & File Formats • **Need , Types , Evaluating & Visibility** 　　Evaluating the Compression System, How much, Compression, How Good is Picture, How fast Does it Compress or Decompress, What H/W & S/W Does it take, Redundancy & Usability • **Compression and Decompressiom** 　　Types of compression ,Need of Data Compression ,Color Gray Scale and Still Video Image , Color Characteristics , Color Model		

3.1	**• Video Compression Technique** Simple Compression Technique, Interpolative, Predictive, Transfer Coding, Discrete Transfer, Statistical (Huffman, arithmetic)JPEG Compression, Requirement Addressing JPEG, Definition of JPEG Standard, Overview of JPEG Components, JPEG methodology, The discrete cosine Transfer , Quantization, Zigzag Sequence, Encoding • **Introduction to Standardization of Algorithm** • **File Formats** • **History of RIF, TIFF** TIFF Specification , TIFF structure , TIFF tag ,TIFF Implementation issues , TIFF classes RIFF Chunks with two sub chunks , List chunk , RIFF waveform Audio File format , RIFF MIDI file Format, RIFF DIB's, • **Introduction to RIFF, AVI** RIFF AVI File format, Index Chunk and Boundary condition handling for AVI files., AVI Indeo File Format.	08	16
3.2	• JPEG-objectives, Architecture, JPEG-DCT encoding Quantization. • JPEG-stastical coding, predictive lossless coding, JPEG performance • MPEG-objectives, Architecture, BIT stream syntax performance • MPEG2 & MPEG4	06	08
04	**Multimedia Authoring and User Interface** 4.1 Multi Media Authoring System and its type 4.2 Hypermedia Application Design consideration 4.3 User Interface Design 4.4 Information Access 4.5 Object Display / Playback Issues	07	16
05	**Distributed Multimedia Systems** 5.1 Components of Distributed Multimedia Systems 5.2 Distributed Client Server Operation 5.3 Multimedia Object Server 5.4 Multi Server Network topologies 5.5. Distributed Multimedia Databases	07	20
06	**Multimedia Tool** 6.1 Introduction to Multimedia tool – Flash 6.2 Creating & Modifying elements 6.3 Line tool, fill/attributes, different shapes, text tools & pen tool 6.4 Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects.	04	08
	Total	**48**	**100**

Practical:
Skills to be developed:
Intellectual skills:

- Use of programming language.

- To be able to apply different logics to solve given problem.

- To be able to write program using different implementations for the same problem

- Identify different types of errors as syntax semantic, fatal, linker & logical

- Debugging of programs

- Understanding different steps to develop program such as

Motor skills:

- Proper handling of Computer System**.**

Practical Content:

All of the experiment shall be performed using MS-Flash or 3D-MAX or MAYA.

Students must also do a mini project covering practical knowledge gained in the subject & submit a brief project report in work book. This report should also include the importance of the project from industry point of view.

Each experiment including mini project shall be stored in the CD and updated after every practical session.

Students shall maintain a work-book giving details of the work-carried out during every practical session.

Assessment shall be done based on the work-book and the CD. This CD along with workbook shall be submitted as term-work.

List of Experiments:

1. Create a cycle & name each part of cycle using different styles & format & animate text.
2. Draw seed & create small plant with use of at least 4 frames.
3. Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
4. Create a forest of trees using the object created earlier. Also add lighting and rain effect.
5. Insert audio to relevant frames that has lighting & rain effect.
6. Convert created work into file format which can be publish on web.
7. Interfacing digital-web-cam, capturing live image & editing using web-cam software.
8. Importing & exporting images, apply different image editing tools.
9. Mini Project: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D-MAX or MAYA software.

Learning Resources:
Books:

Sr. No.	Author	Title	Publication
01	Prabhat k. Andheigh, Kiran Thakrar, John F	Multimedia Systems Design	Prentice Hall of India
02	Koegel Buford	Multimedia Systems	Pearson Education
03	Katherine Ulrich	Micromedia Flash for Windows and Macintosh	Pearson Education
04	Free Halshall	Multimedia Communication	Pearson Education
05	R. Steimnetz, K. Nahrstedt	Multimedia Computing, Communication and Application	Pearson Education
06	J.D. Gibson	Multimedia Communication Directions and Innovations	Academic Press, Hardcourt India
07	J.F. Kurose, K. W. Rose	Computer Networking	Pearson Education

Course Name : Diploma in Computer Engineering

Course Code : CO/CD

Semester   : Fifth for CO and Sixth for CD

Subject Title : Advanced Microprocessor (Elective-I)

Subject Code : 12181

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	--	--	25@	125

NOTE:

> ➢ **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**

> ➢ **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:

Advanced microprocessors are the requirement of current market. The 8086 has certain limitations, so the microprocessor Intel 80286 was introduced with memory management, privilege & protection. The Intel 80386, 80486, Pentium are the advanced microprocessors which support multitasking, with high speed execution, enhanced instruction set, five stage pipelining architecture & incorporating parallelism. The importance of microprocessor based system design cannot be underestimated in today's world, as they are extensively used in industrial area.

This subject covers the fundamental concepts of advanced microprocessors and their architectures.
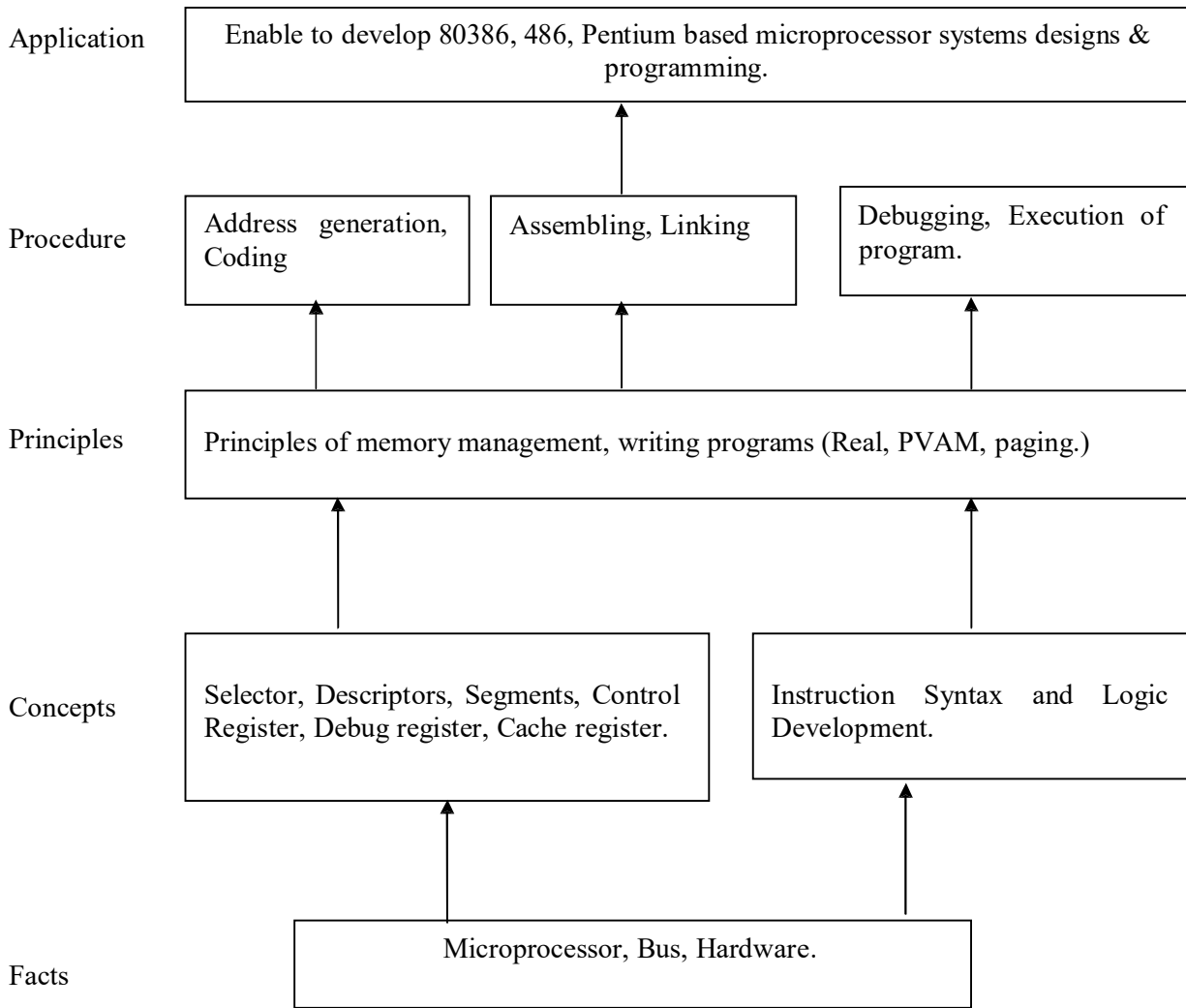
This will enable students to write efficient programs in assembly language. It covers the interesting programming & application part of microprocessors.

Objectives:

Students will be able to:

1. Explain architecture and memory management of 80286.
2. Explain concepts of multitasking
3. Know architecture and memory management of 80386.
4. State the concept of paging
5. Describe features and architecture of 80486, Pentium.
6. Programming in assembly using different functions of DOS & BIOS interrupts.

Learning Structure:

Application	Enable to develop 80386, 486, Pentium based microprocessor systems designs & programming.

Procedure	Address generation, Coding	Assembling, Linking	Debugging, Execution of program.

Principles	Principles of memory management, writing programs (Real, PVAM, paging.)

Concepts	Selector, Descriptors, Segments, Control Register, Debug register, Cache register.	Instruction Syntax and Logic Development.

Facts	Microprocessor, Bus, Hardware.

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**16-bit Microprocessor - Intel 80286.** 1.1 Salient features, Internal architecture, Register organization. (General purpose register, segment register, status and control register, instruction pointer, segment descriptor cache register)	14	16
	1.2 Addressing mode such as Real, Protected Virtual Addressing mode, Selector, Descriptors and its types, LDT, GDT, IDT, privilege protections. Operations of 80286 in Real and PVAM.		16
02	**32-bit Microprocessor –Intel 80386.** 2.1 Salient features, internal architecture, Register organization (General-purpose register, segment register, status and control register, instruction pointer. Segment descriptor cache register. System address register LDTR & GDTR, TR, Debug register, Test registers, Control register. 2.2 Addressing modes of 80386, real, PVAM, paging, virtual 8086. Address translation in real, PVAM, paging, Enabling and disabling paging (Machine Status word)	14	30
03	**Interrupts of X86 microprocessor:** 3.1 Introduction to X86 interrupts (Hardware, software and exceptions), Interrupt vector table, Interrupt processing sequence. Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) software interrupts (INT, INTO instructions) 3.2 Introduction to MS-DOS, The structure of MS-DOS (BIOS Module, DOS kernel, command processor), Loading of MS-DOS introduction to *.com* and *.exe* programs, DOS & BIOS Interface, Interrupt Services, DOS& BIOS Interrupts.	12	22
04	**Advanced Microprocessors (Intel 486 & Pentium)** 4.1 Salient features of 486. Salient features of Pentium System architecture (Super-scalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction.	08	16
	Total	**48**	**100**

Practical:
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**.**

List of Practical:

1) Write an assignment on keyboard and display function 01H.,02H,08H,09H,0AH of DOS INT 21H and program to read password & validate the user.

2) Write an assignment on keyboard functions 02H of BIOS INT 16H (Get Keyboard Flags) and program to display the status of keys described in 02H functions of BIOS INT 16H.

3) Write an assignment on screen functions 06H (Scroll screen up), 07H (Scroll screen down) of BIOS INT 10H and program to simulate CLS (Clear Screen) command.

4) Write an assignment on ASCIIZ string, file handle, file functions 41H (delete file), 56H (Rename file) of DOS INT 21H and program to simulate DEL (Delete file) and REN (Rename file) command.

5) Write an assignment on file functions 43H (Set/Get file attribute) and 57H (Set/Get file time & date) of DOS INT 21H and program to display the attribute and date/ time of any file.

6) Write an assignment on directory functions 39H (Create directory), 3AH (Delete directory) of DOS INT 21H and program to simulate MD (Make directory), RD (Remove Directory) commands.

7) Write an assignment on directory functions 3BH (Change Directory), 47H(Get current directory) of DOS INT 21Hand program to simulate CD (Change directory) and PWD (Present Working Directory) commands.

8) Write an assignment on Disk Storage Organization i.e. track, sector, cylinder, cluster, disk system area, data area and disk processing functions 02H(Read Sector), 03H (Write sector) of BIOS INT 13H.

9) Write a program to read any sector from floppy and display the contents of that sector on the screen.

10) Write an assignment on Printer Control Characters i.e. Horizontal TAB, Line Feed, Form Feed, Carriage Return, Printer function 40H, 05H of DOS INT 21 H and 00H (Print character) of BIOS INT 17H and program to print ASCII character set on printer.

11) Write a program to display the status of Flag register and Machine Status Word register of 286 on the screen.

12) Write a program to display the status of Flag register and Machine Status Word register Of 386 on the screen.

Learning Recourses:

  1. **Books**

Sr. No.	Author	Book Title	Publication
01	Peter Abel	IBM-PC assembly language & programming	Prentice Hall India
02	A. K. Ray. K. M. Bhurchandi	Advanced microprocessor & peripheral	TATA McGraw Hill
03	Ray Duncan	Advanced MS. DOS Programming	BPB Publication

  2. **Website:**
      > **www.intel.com**
      > **www.pcguide.com/ref/CPU**
      > **www.techsource.com /engineering_parts/microprocessor.html**

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

Course Name : Diploma in Computer Engineering/ Information Technology

Course Code : CO/IF/CD

Semester   : Fifth for CO and Sixth for CD

Subject Title : Windows Programming (Elective-I)

Subject Code : 12182

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	04	03	100	--	--	25@	125

NOTE:

> ➢ **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**
> ➢ **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:

Microsoft Window is a graphical environment. Window provides rich programming environment that supplies extensive support for developing easy to use and consistent user interface. Windows provides device independent graphics thereby allowing you to write programs without having detail knowledge of the hardware platform on which they will eventually run.

Visual C++ has powerful features for writing windows applications such as class wizards and ActiveX controls. Class wizards write code for you! In the industry this type of program is often referred to as a CASE (Computer Aided Software Engineering). ActiveX controls are pieces of Software that you can easily "Plug" in to your Visual C++ environment..
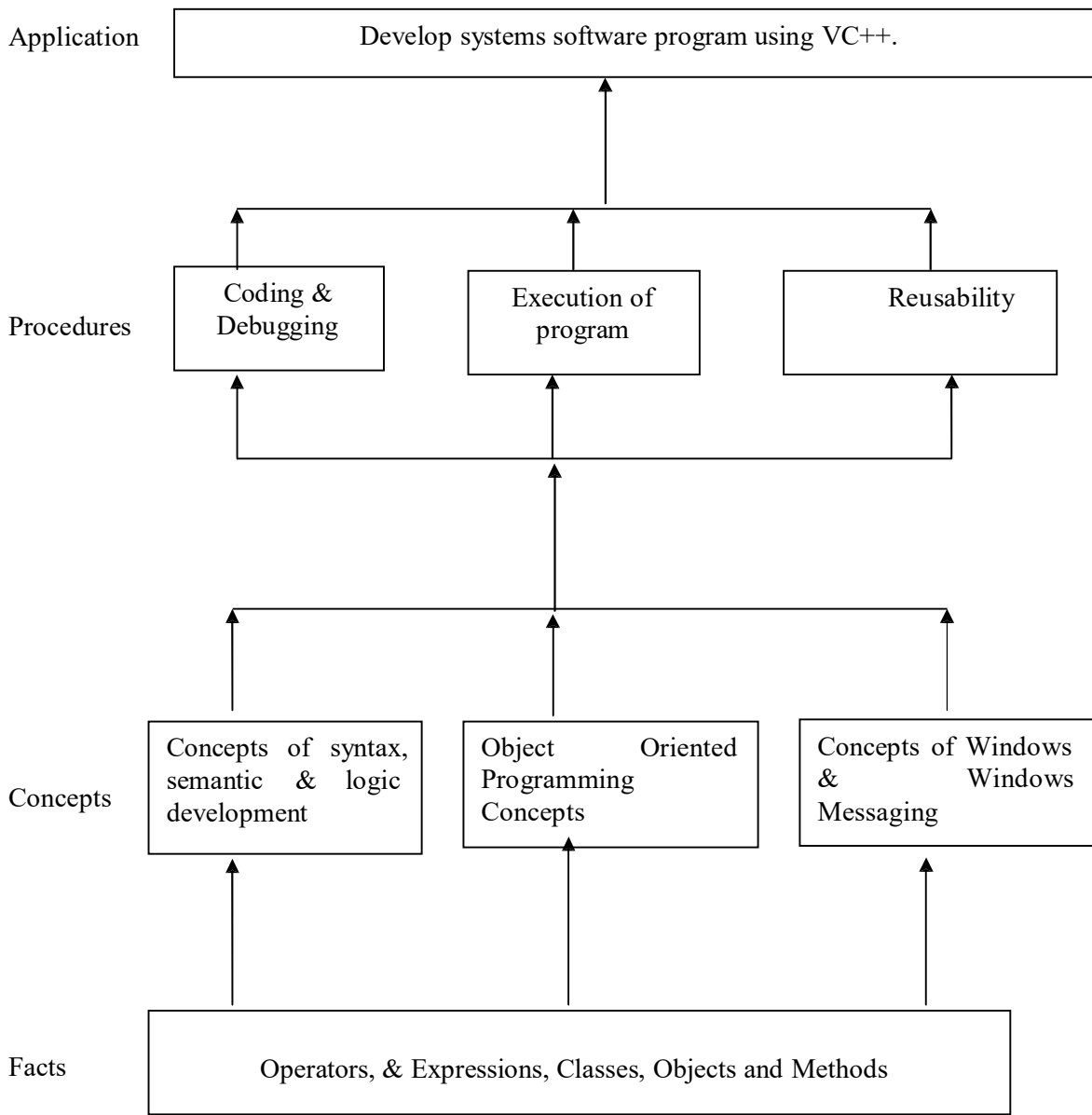
This Subject covers from Basics to writing codes for Keyboard & Mouse handling.

Objectives:

Students will be able to:

1. Use Visual C++ environment.
2. Write simple windows under 'C' programs using VC++ environment.
3. Develop program for drawing dot, lines and shapes.
4. Handle Keyboard and Mouse input through programs.
5. Create Checkbox, Scroll bars etc.

Learning Structure:

Application

Develop systems software program using VC++.

Procedures

Coding & Debugging	Execution of program	Reusability

Concepts

Concepts of syntax, semantic & logic development	Object Oriented Programming Concepts	Concepts of Windows & Windows Messaging

Facts

Operators, & Expressions, Classes, Objects and Methods

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Overview of Windows messaging.** **1.1** • The Windows Environment, History of Windows, Aspects of Windows, Windows Programming Options, APIs and Memory Models, The Programming Environment, Your First Windows Program, • The MessageBox Function, A Brief History of Character Sets 20 American Standards, Wide Characters and C, The char Data Type, Windows' String Functions, Using printf in Windows, Formatting Message Box. **1.2** • Registering the Window Class, Creating the Window, Displaying the Window, the Message Loop, and the Window Procedure.	12	24
02	**GDI and Basic Drawings** 2.1 • An Introduction to GDI, The Structure of GDI, The GDI Philosophy, The GDI Function Calls, The GDI Primitives, The Device Context. 2.2 • Drawing Dots and Lines, Setting Pixels, Filling in the Gaps, Drawing Filled Area, The GDI Mapping Mode Rectangles, Regions, and Clipping.	10	24
03	**The Keyboard** 3.1 Keyboard Basics, Keystrokes and Characters, Using Keystroke Messages, Character Messages, Keyboard Messages and Character Sets, The KEYVIEW1 Program, The Foreign-Language Keyboard Problem, The Caret (Not the Cursor), The Caret Functions.	08	16
04	**The Mouse** 4.1 • Mouse Basics, Client-Area Mouse Messages, Simple Mouse Processing: An Example, Mouse double-clicks, Nonclient-Area Mouse Messages, The Hit-Test Message, A Sample Program 4.2 • Emulating the Mouse with the Keyboard, Using Child Windows for Hit-Testing, Capturing the Mouse.	08	16

05	5.1 • The Button Class, Creating the Child Windows, Push Buttons, Check Boxes, Radio Buttons, Group Boxes, Changing the Button Text, Visible and Enabled Buttons, Buttons and Input Focus, Controls and Colors, System Colors, The Button Colors, The WM_CTLCOLORBTN Message, 5.2 • The Scroll Bar Class 383 The COLORS1 Program Coloring the Background, Coloring the Scroll Bars and Static Text, The Listbox Class, List Box Styles, Putting Strings in the List Box, Selecting and Extracting Entries, A Simple List Box Application.	**Client Window Controls**	10	20
		Total	**48**	**100**

Practical:

Skills to be developed:

Intellectual skills:

- Use of programming language.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem.
- Identify different types of errors as syntax semantic, fatal, linker & logical.
- Debugging of programs.
- Understanding different steps to develop program such as.

Motor skills:

- Proper handling of Computer System.

List of Practical:

Sr. No.	Title of Experiment	No of Practical
1	Demonstration of Visual Environment	1
2	Writing simple 'C' under windows programs using VC++	2
3	Writing programs on drawing dots, lines, rectangles, filling different shapes.	8
4	Program on reading keystrokes from Keyboard.	2
5	Program on displaying text at desired window	1
6	Finding size, Resizing windows	2
7	Program on handling mouse	2
8	Creating different controls (such as checkbox, scrollbar, etc)	6
9	Program on timer demonstration	2

Learning Recourses:

1. **Books**

Sr.No.	Author	Title	Publication
1	Charles Petzold	Programming Windows	Microsoft Press
2	Brent E. Rector Joseph M. Newcomer	Win32 Programming	Addison Wesley

2. **Website**

http://elvis.rowan.edu/~kay/cpp/vc6_tutorial/

http://www.onesmartclick.com/programming/visual-cpp.html

http://www.functionx.com/visualc/

Course Name : Computer Engineering Group

Course Code : CO/CM/CD/IF

Semester : Fifth for CO/CM/IF and Sixth for CD

Subject Title : Network Management and Administration

Subject Code : 12183

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
01	--	04	--	--	--	25#	25@	50

Rationale:

It is an era of computers. In each and every field, computers are used for different applications. So, personal computer users have a need to connect their intelligent workstation to other computers for sharing peripherals such as printers with a user at another personal computer. The users may have a need to access data or execute applications software that resides on another computer. Again the user may need special processing capabilities that are only available on the other computer.

The task of connecting our stand-alone computers often requires a thorough knowledge of connectivity, hardware and software. It provides practical knowledge that will enable the students to get a connectivity job done quickly and easily so the students can get on with the applications and data sharing work they need to do.
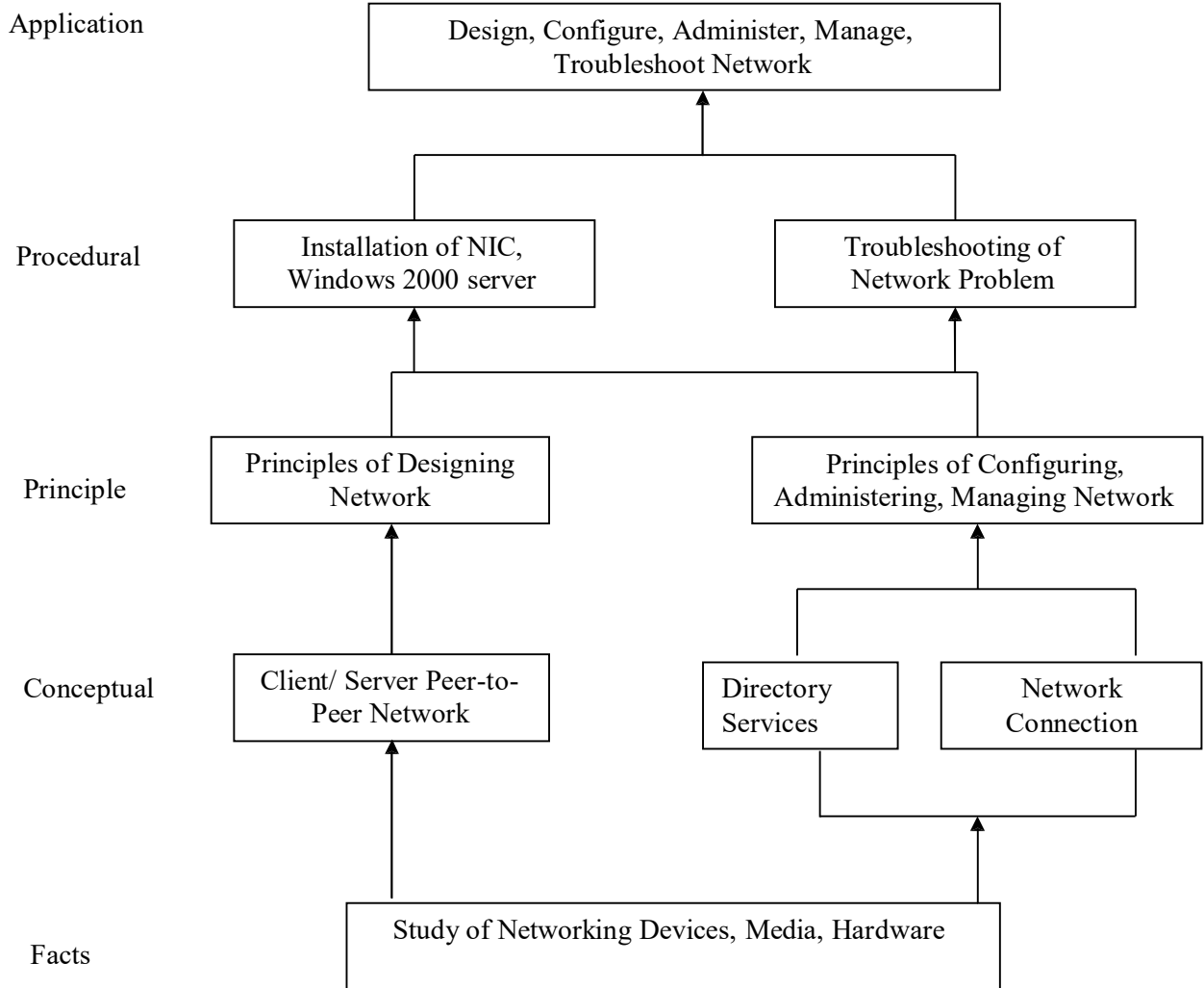
This subject is network application based subject. It gives the practical knowledge of designing computer network while using any type of topologies. This subject covers the installation and configuration of any network operating system. With the proper configuration of operating system on the server, the students will manage and administer the network resources or devices such as printers, scanner, driver and also software like files, folders, directories, applications, programs etc.

Objective:

The students will be able to:

1. Compare different types of network.
2. Describe the different types of network directory services.
3. Design the computer network.
4. Configure the networking resources and software from the server.
5. Know the network management and administration.
6. Apply the different types of network technologies for internet connection.
7. Troubleshoot and repair the network faults**.**

Learning Structure:

Application | Design, Configure, Administer, Manage, Troubleshoot Network

Procedural | Installation of NIC, Windows 2000 server | Troubleshooting of Network Problem

Principle | Principles of Designing Network | Principles of Configuring, Administering, Managing Network

Conceptual | Client/ Server Peer-to-Peer Network | Directory Services | Network Connection

Facts | Study of Networking Devices, Media, Hardware

Contents: Theory

Chapter	Name of the Topic	Hours
01	**Exploring Directory Services and Remote Network Access.** 1.1 Network Related Jobs – Network Administrator, Network Engineer, Network Architecture / Designer, Other Network Related Jobs. 1.2 Directory Services - Define Directory Services, Definition of Novelle Directory, Windows NT domains, Microsoft's Active Directory, X500 Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves. 1.3 Active Directory Architecture – Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests. 1.4 Remote Network Access – Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV. 1.5 Virtual Private Network – VPN Protocols, Types of VPNs, VPN Clients, SSL VPNs.	02
02	**Network Connection and Printing Services** 2.1 Dynamic Host Configuration Protocol (DHCP) – DHCP Origins, Reverse Address Resolution Protocol (RARP), The Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture. 2.2 Introduction to Domain Name System(DNS) - DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration. 2.3 Understand Network Printing Concepts - Understand Network Printing Concepts, Locally connected print devices, Setting up local print devices, Shared print devices, Sharing Locally Attached Print Devices, Describe Windows Network Printing, Add Print Wizard.	02
03	**Implementation of Network** 3.1 Designing Network – Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs – Choosing Network Type, Choosing Network Structure, Choosing Servers. 3.2 Installing and Configuring Windows 2003 Server - Preparing for Installation, Creating windows 2003 server boot disk, Installing windows 2003 server, Configuring server/ client 3.3 Setting windows 2003 server - Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration.	04
04	**Administering Windows 2000 Server (The Basics)** 4.1 Working With User Accounts - Adding a User, Modifying User Account, Deleting or Disabling a User Account. 4.2 Working With Windows 2000 Security Groups – Creating Group, Maintaining Group Membership. 4.3 Working with Shares – Understanding Share Security, Cresting Shares, Mapping Drives 4.4 Administering Printer Shares – Setting up Network Printer, 4.3 Working with Windows 2000 Backup – Using Windows 2000 Servers Backup Software	04

05	Troubleshooting and security of Network 5.1 Understanding the Problem – Troubleshooting, Segmenting the Problem, Isolating the Problem, Setting Priorities. 5.2 Troubleshooting Tools – Hardware Tools, Software Tools, Monitoring and Troubleshooting Tools 5.3 Internal Security – Account Security, File and Directory permissions, Practices and user education. 5.4 External Threats – Front Door threats, Back Door threats, Denial services threats, Viruses, worms and other Malicious codes.	04
	Total	**16**

Practical:
Skills to be developed:

Intellectual skills:

Fault finding of network
Troubleshooting of network
Proper installation of network

Motor skills:

- Proper handling of Computer System hardware.

List of Practical:

Sr. No.	Practical Name
1	Creating Windows 2003 Server Boot Disk.
2	Installing Windows 2003 Server
3	Installing Active Directory
4	Creating AD Objects
5	Setting up Local Print Device
6	Installing and Configuring a Network – Capable Print Device
7	Create new Users & give the Permission
8	Group of four students prepare a mini report on Latest Networking Technology

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publication
1	Craig Zacker	The Complete Reference Networking	Tata McGraw-Hill Edition

2	Bruce Hallberg	Networking A Beginner's Guide	Tata McGraw-Hill Edition
3	Richard A. McMohan, Sir	Introduction to Networking	Tata McGraw-Hill Edition
4	Microsoft Press	Networking + Certification Training Kit	--
5	Microsoft Press	MCSE Training Kit Networking Essential Plus	--

2. Sources of Information –

1) Computer Magazine　　2) Computer Today
3) PC Quest　　4) Information Technology
5) Internet　　6) Linux for U

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester   : Fifth for CO/CM/IF and Sixth for CD

Subject Title : Professional Practices-V

Subject Code : 12184

Teaching and Examination Scheme:

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

Rationale:

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

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.
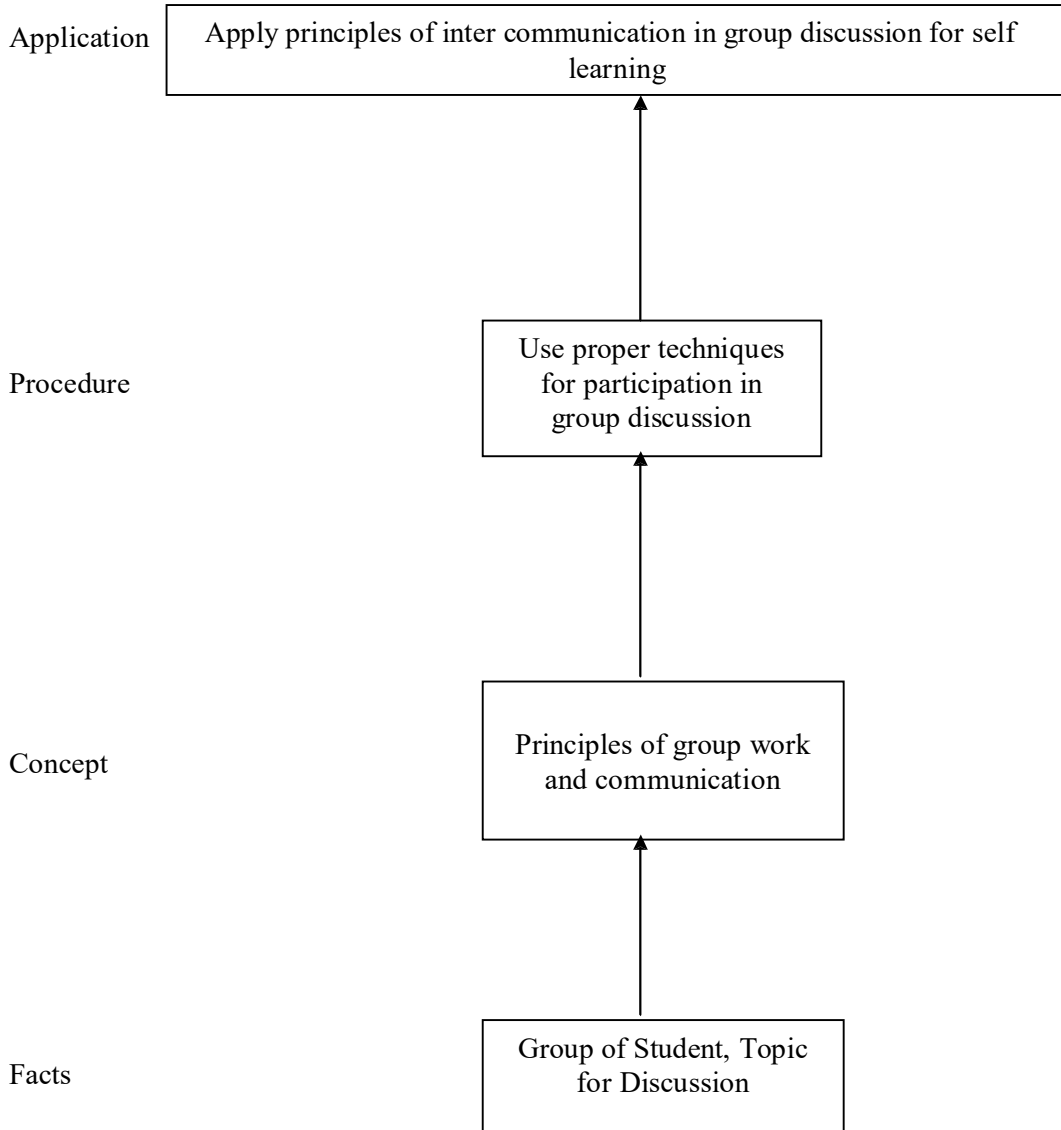
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Learning Structure:

Application — Apply principles of inter communication in group discussion for self learning

↑

Procedure — Use proper techniques for participation in group discussion

↑

Concept — Principles of group work and communication

↑

Facts — Group of Student, Topic for Discussion

Contents:

Activity	Content
01	**Industrial Visits** Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work. Visit any IT industry/ computer center. Study their network (Cable layout, devices used/software/costing)

02	**The Guest Lecture/s from field/industry experts, professionals is/are to be arranged (minimum 3 nos.) from the following or like topics. The brief report is to be submitted on the guest lecture by each student as a part of Term work.**
	  a) IT – Current Scenario
	  b) Software engineering Industrial applications
	  c) Animation techniques
	  d) Certification course guidance
	  e) Carrier guidance
	  f) Preparation of Bio-data
	  g) Linux Installation and administration
	  h) Entrepreneurship development
	  i) E - commerce
	  j) Any other suitable topic

03	**Information Search** Each student will search topic for Industrial project of sixth semester and prepare synopsis and project plan. Get it approved from concerned authority.

04	**Group Discussion :**
	The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The faculty members may select the topic of group discussions. Some of the suggested topics are -
	  i) Current issues.
	  ii) Load shading and remedial measures.
	  iii) Use of mobile in college campus
	  iv) Brain drain
	  v) Internet surfing good or bad
	  vi) Any another suitable topic

05	**Seminar :** Seminar should be on selected industrial project's synopsis and week wise plan for completion of project. Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time – 10 minutes)