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

COURSE NAME : DIPLOMA IN COMPUTER TECHNOLOGY

COURSE CODE : CM

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

SEMESTER : FIFTH | DURATION : 16 WEEKS

PATTERN : FULL TIME - SEMESTER | SCHEME : G

SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		SW (17500)
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Operating System β	OSY	17512	03	--	02	03	100	40	--	--	--	--	25@	10	
2	Software Engineering β	SEN	17513	03	--	--	03	100	40	--	--	--	--	--	--	
3	Computer Security	CSE	17514	03	--	02	03	100	40	--	--	--	--	25@	10	
4	Java Programming β	JPR	17515	03	--	04	03	100	40	50#	20	--	--	25@	10	
5	System Programming	SPR	17517	03	--	02	03	100	40	25#	10	--	--	25@	10	50
6	Behavioural Science $	BSC	17075	01	--	02	--	--	--	--	--	25#	10	25@	10	
7	Network Management and Administration β	NMA	17061	01	--	04	--	--	--	50#	20	--	--	25@	10	
8	Professional Practices-III	PPT	17062	--	--	02	--	--	--	--	--	--	--	50@	20	
	TOTAL			17	--	18	--	500	--	125	--	25	--	200	--	50

Student Contact Hours Per Week: **35 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 900**

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

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 : **Computer Engineering Group**

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

Semester : **Fifth**

Subject Title : **Operating System**

Subject Code : **175**

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:

Operating system is the software that makes a computers system operational. It is an interface between the human and machine. It drives all the hardware parts of the computer and is the first piece of software to run on the machine when the system boots.

OS is a core technology subject, the knowledge of which is mandatory for every user. If familiarizes a learner with the OS concepts, structure internal functionality and services and resource sharing. It will help a learner with OS design concepts. This subject will give a learner an overview of UNIX / LINUX OS.

General Objectives:
To develop following skills:

Intellectual skills:
1. Learn the various milestones in the history of Operating Systems and various Generations of computers as well as the modern trends in Operating Systems.
2. Understand the kernel architectures, the functions of operating systems and the use of system calls.
3. Understand the concept of processes, multiprogramming, Process Control Blocks, context switching.
4. Learn about the scheduler and implement various scheduling algorithms.
5. Understand about Deadlocks, Inter-process communications.
6. Learn about Memory Management and File Management techniques of the OS.
7. Understand the structure and file system structure of Unix OS.
8. Use UNIX commands, vi editor and file utilities and write shell scripts.

Theory:

Topic No.	Contents	Hours	Marks
01	**Introduction:** **Objectives:** ➢ Distinguish between various generation of computer. ➢ Classify different types of operating system. 1.1 Operating System - Evaluation, Generations 1st, 2nd, 3rd 1.2 Different Types of Operating systems- Batch operating system, Multi Programmed, Multitasking, Time Shared OS. Multiprocessor Systems, Distributed Systems, Cluster Systems, Real time systems.	04	12
02	**Operating System Structures**: **Objectives:** ➢ State services & functions of Operating Systems. ➢ Use system calls ➢ Distinguish between different kernel architecture. 2.1 Different Services of Operating System. 2.2 System Calls- Concept, Types and Uses 2.3 Simple Structure, Layered, Monolithic, Microkernel. 2.4 Components activities- Process Management, Main Memory Management, File Management, I/O System management, Secondary storage management.	08	18
03	**Process Management** : **Objectives:** ➢ Describe Process, process scheduling, schedulers. ➢ Describe inter-process communication & synchronization. ➢ Describe critical section problem & solution to ensure the consistency of shared data ➢ Describe multithreading models. 3.1 Process-Concept, process states, Process Control Block. 3.2 Process Scheduling- Scheduling Queues, Schedulers, Context switch. 3.3 Inter-process communication- Introduction, shared memory system & message passing system, critical section problem, semaphores. 3.4 Threads - Benefits, users and kernel threads, Multithreading Models - Many to One, One to One, Many to Many.	10	22
04	**Scheduling :** **Objectives:** ➢ Describe CPU scheduling. ➢ Describe various CPU-scheduling algorithms. ➢ Solve problems based on them. ➢ Describe deadlock and its algorithm. 4.1 Scheduling & its types - Objectives, concept, CPU and I/O burst cycles, Pre-emptive, Non- Pre-emptive Scheduling, Scheduling criteria. 4.2 Types of Scheduling algorithms - First come first served (FCFS), Shortest Job First (SJF), Shortest Remaining Time(SRTN), Round Robin (RR) Priority scheduling, multilevel queue scheduling 4.3 Deadlock - System Models, Necessary Conditions leading to Deadlocks, Deadlock Handling - Preventions, avoidance, Banker's	10	20

	algorithm		
05	**File System and Memory Management** : **Objectives:** ➢ Distinguish between memory allocation methods ➢ Distinguish between various file access methods. ➢ Describe files, file attributes and file structure. 5.1 Basic Memory Management - Partitioning, Fixed and Variable, Free Space management Techniques - Bitmap, Linked List. 5.2 Virtual Memory – Concept, Segmentation, Paging, Page table, Page fault. 5.3 File – Concepts, Attributes Operations, Types, and File System Structure. 5.4 Access Methods – Sequential, Direct, Swapping, File Allocation Methods- Contiguous, Linked, Indexed. 5.5 Directory Structure – Single level, Two levels.	10	20
06	**UNIX : A Case Study** **Objectives:** ➢ Draw system structure and file system structure of UNIX ➢ Distinguish between UNIX and LINUX system Introduction, Overview of UNIX, Structure of UNIX OS, Booting, File System Of UNIX, UNIX and LINUX Comparison.	06	08
	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Differentiate between various Operating System	02
2	Use of file processing and Communication command – tr, wc, cut, paste, sort	02
3	Use of file processing and Communication command- who, who am I, mesg, talk, wall, write, news, mail.	02
4	Use of general purpose and process commands- date, time, cal, clear, banner	02
5	Use of general purpose and process commands- , tty, man, bc, ps, wait, sleep, exit, kill.	02
6	Work with file and directory commands viz, pwd, cat, ls, cd, mkdir, rmdir, rm, mv	02
7	Work with file and directory commands viz cp, join, split, head, tail, omm., pr, chmod, cmp.	02
8	Use of vi editor and editor commands	04
9	Write and execute menu driven shell scripts using case structures(any two)	02
10	Write and program to implement the Shortest Job First algorithm.	04
11	Write and program to implement the Priority scheduling algorithm.	04
12	Write and program to implement the Round-Robin algorithm.	04

**Students can perform any ten practical

Learning Recourses:

1. Books:

Sr. No	Book Title	Author	Publication
01	Operating System Concepts-VIIIth Edition	Silberschatz Galvin	John Wiley and Sons
02	Operating System	Achyut S. Godbole	Tata McGraw Hill
03	Operating System	William Stallings	Pearson
04	Modern Operating systems	Andrew tanenbaum-3rd edition	PHI
05	Unix Concept and Programming	Sumitabha Das	Tata McGraw Hill
06	UNIX Programming	Kumar Saurabh	Wiley India

2. Websites:

1. cs.wisc.edu/~ bart/537 lecture notes-University of Wisconsin Madison.
2. www.cs.kent.edu/osf o3/notes/index.html- Vilinius Gediminas Technical University
3. http://www.howstuffworks.com/operating-system1.htm
4. *www.computerhope.com/jargon/o/os.htm*
5. *en.wikipedia.org/wiki/Operating system*

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

Course Name : Computer Engineering Group

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

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

Subject Title : Software Engineering

Subject Code : 17513

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 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:

Today, Computer Software is the most important technology on the world stage. Software Engineering is the basis for Software development. Software Engineering helps pave a path towards easier, faster, and less expensive methods to build and maintain high quality softwares.

Software Engineering is about imagination and creativity, the process of creating something apparently tangible from nothing. It presents a framework for the Software Engineers that provides a road-map for building high quality software products, within time and cost constraints.
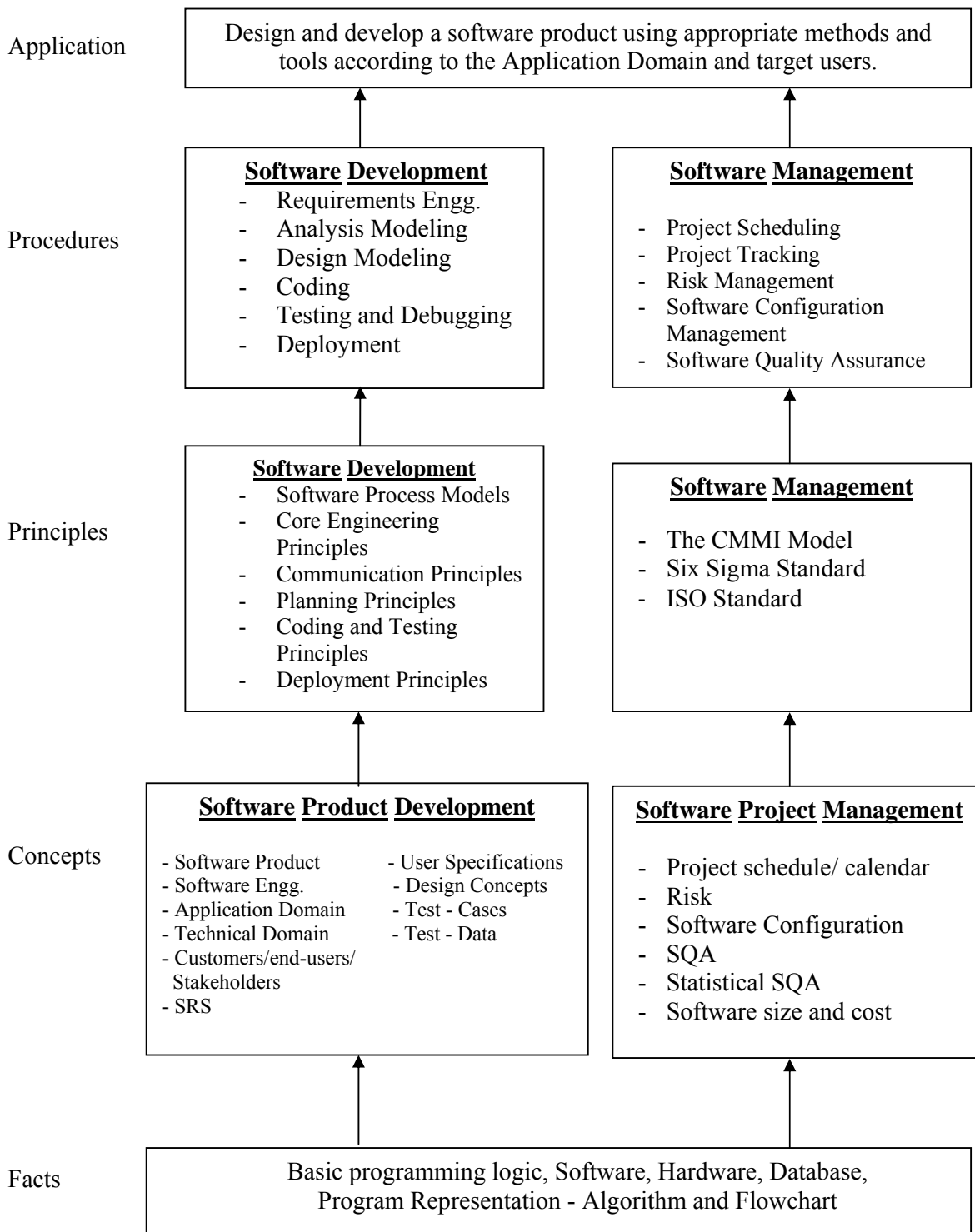
This Subject helps the students to wonderfully blend the knowledge they have acquired from the First Semester to the Fifth Semester into a practically feasible creative concept. The students will then be able to convert this creative concept/idea into commercially viable product in the Sixth Semester under the head Industrial Project.

Objectives:

To develop following skills:

Intellectual Skills:

1. To develop awareness about the concepts of Software Development Life Cycle (SDLC).
2. To develop scientific and engineering approach towards software product development.
3. To develop both, the technical skills as well as managerial skills needed for software development.
4. Understand to conceive, plan, design, develop, and deploy software projects.
5. To be able to implement new ideas into real product.

Learning Structure:

Application	Design and develop a software product using appropriate methods and tools according to the Application Domain and target users.

Procedures	**Software Development** - Requirements Engg. - Analysis Modeling - Design Modeling - Coding - Testing and Debugging - Deployment	**Software Management** - Project Scheduling - Project Tracking - Risk Management - Software Configuration Management - Software Quality Assurance

Principles	**Software Development** - Software Process Models - Core Engineering Principles - Communication Principles - Planning Principles - Coding and Testing Principles - Deployment Principles	**Software Management** - The CMMI Model - Six Sigma Standard - ISO Standard

Concepts	**Software Product Development** - Software Product - Software Engg. - Application Domain - Technical Domain - Customers/end-users/ Stakeholders - SRS - User Specifications - Design Concepts - Test - Cases - Test - Data	**Software Project Management** - Project schedule/ calendar - Risk - Software Configuration - SQA - Statistical SQA - Software size and cost

Facts	Basic programming logic, Software, Hardware, Database, Program Representation - Algorithm and Flowchart

Contents: Theory

Chapter	Name of the Topic	Hours	Marks

01	**Overview Of Software Engineering And The Software Development Process**
	Objectives:-
	  ❯ To understand meaning of Software and the types of Software.
	  ❯ To understand the Software Engineering approach and its need
	  ❯ To understand role of a software process and a process model in a software project.
	  ❯ To understand various activities in the Software Process.
	  ❯ To know various models for the Software development process.
	1.1 Definition of Software and Characterstics of Software
	1.2 Types / Categories of Software
	1.3 Software Engineering – Definition, Need
	1.4 Relationship between Systems Engineering and Software Engineering
	1.5 Software Engineering- A Layered Technology Approach
	1.6 Software Development Generic Process Framework- Software Process, Software Product, Software Work-Product, Basic Framework Activities, Umbrella Activities
	1.7 Personal and Team Process Models (PSP and TSP) – Concept, Significance with respect to Ongoing Process Improvement, Goals, List of framework activities included
	1.8 Prescriptive Process Models-
	  • The Waterfall Model (Nature, Situations in which applicable with example, Associated Problems)
	  • The Incremental Model (Nature, Situations in which applicable with example, General steps, Drawbacks)
	  • RAD Model (Nature, Situations in which applicable with example,General steps, Drawbacks)
	  • Prototyping (Nature, Situations in which applicable with example, General steps, Drawbacks)
	  • Spiral Model (Nature, Situations in which applicable with example, General steps, Advantages, Disadvantages)
	1.9 Agile Software Development –
	  • Difference between Prescriptive and Agile Process Model
	  • Features of the Agile Software Development Approach
	  • Concept of Extreme Programming.
		08	20

02	**Software Engineering Practices And Software Requirements Engineering**
	Objectives:-
	➢ To become familiar with the standard Software Engineering Practices.
	➢ To understand to carry out Requirements Engineering Tasks.
	➢ To understand the importance of the SRS Document in the software
	    Project.
	2.1 Software Engineering Practices - Definition, Importance, Essence
	2.2 Core Principles of Software Engineering (Statements & Meaning of each Principle)
	2.3 Communication Practices
	    (Concept, Need of Communication, Statements and Meaning of each principle)
	2.4 Planning Practices
	    (Concept, Need of Planning, Basic Activities included, Statements and Meaning of each principle)
	2.5 Modelling Practices
	  • Concept of Software Modelling
	  • Analysis Modelling
	    (Concept, Name of the analysis domains represented, Analysis
	      Modelling Principles - Statements & Meaning of each principle
	  • Design Modelling
	    (Concept, Name of the three design aspects, Design Modelling Principles - Statements & Meaning of each principle)
	2.6 Construction Practices
	  • Concept of Software Construction
	  • Coding (Concept, Preparation Principles, Coding Principles, Validation Principles)
	  • Testing (Concept, Testing Principles)
	2.7 Software Deployment
	  • Concept of Delivery Cycle, Support Cycle & feedback Cycle
	  • Deployment Principles- statements & meaning of each principles
	2.8 Requirements Engineering
	  • Concept of Requirements Engineering
	  • Requirement Engineering Tasks (Concept and sub-tasks included)
	2.9 SRS (Software Requirements Specifications)
	  • Concept of SRS
	  • General Format of SRS
	  • Need/Importance of SRS
		06	16

03	**Analysis And Design Modelling** **Objectives:-** ➢ To understand to build Analysis Model for a Software. ➢ To understand to apply design concepts and to build design	12	18

elements

3.1 Analysis Modelling
- Concept and need of Analysis Modelling
- Objectives of Analysis Modelling

3.2 Analysis Modelling approaches
- Structured Analysis (Concept)
- Object Oriented Analysis (Concept)

3.3 Domain Analysis
- Concept of Technical Domain of the software (to be discussed with examples)
- Concept of Application Domain of the Software (to be disscussed with the examples: Finance & Banking, Hospitability, Health care, Embeded Software, Inventory System, etc.)
- Goals
- Inputs and Output of Domain analysis

3.4 Building the Analysis Model
- Data Modelling Concepts
   (Meaning of the Terms- Data Objects, Data Relationships, Data Attributes, Cardinality & Modality with Examples)
- Flow- Oriented Modelling
   - DFD (Use, Standard Notations, Rules to be followed, DFD Construction – Using any case Study)
   - Data Dictionary(Concept, Use, contents to be incoporated, Advantages)
   - Creating a Control Flow Model (Nature of software applications where it is required and used, Guidelines used for creating the model)
   - Creating Control Specifications (CSPEC)
   - Creating Process Specifications (PSPEC)
- Scenario- Based Modelling
   - Developing Use Cases
   - What is a Use Case?
   - Purpose of a Use Case
   - Use Case Diagram
- Creating a behavioural model
   - Concept
   - General Steps involved

3.5 Design Modelling
- Design Process
   - Concept of Software Design
   - Design Quality Guidelines
- Design Concepts
   - Meaning and importance of the following eight concepts w.r.t. ease of design, development, testing and debugging- i) Abstration ii) Architecture iii) Patterns iv) Modularity v) Information Hiding vi) Functional Independence vii) Refinement viii)Refactoring

3.6 The Design model
- Data Design Elements
- Architectural- Design elements

		• Interface Design Elements • Component-Level design elements • Deployment-Level Design Elements		

04		**Software Testing Strategies And Methods**
		Objectives:-
		   ➢ To become familiar with concepts and strategies of Testing
		     and Debugging.
		4.1 Software Testing Fundamentals
		   • Definition of Software Testing
		   • Concept of - Good Test, Successful Test, Testing strategies,
		     Test Plan, Test Cases, Test Data.
		4.2 Characterstics of Testing Strategies
		4.3 Software Verification and Validation (V&V) - Concept and
		    difference between these two.
		4.4 Testing Strategies
		   • Unit Testing
		   • Integration Testing
		     - Top-Down Approach
		     - Bottom-up Approach
		     - Regression Testing
		     - Smoke Testing
		4.5 Alpha and Beta Testing (Concept and differences)
		4.6 System Testing
		   • Concept of System Testing
		   • Types (Recovery, Security, Stress, Performance Testing)
		     with examples
		4.7 Concept of White-box and Black-Box Testing
		4.8 Debugging
		   • Concept and need of Debugging
		   • Characterstics of bugs
		4.9 Debugging Strategies
		   • Concept of Brute Force, Back Tracking, Induction,
		     Deduction
			08	16

05	**Software Project Management**
	Objectives:-
	  ➢ To understand the importance of Project Scheduling.
	  ➢ To become familiar with Project Scheduling Techniques.
	  ➢ To understand the concept of software risks and Risk Managemant.
	  ➢ To understand the importance of Software Configuration Management.
	5.1 Introduction to Software Project Management and its need.
	5.2 The Management Spectrum – 4 Ps and their Significance
	5.3 Project Scheduling
	  • Concept of Project Scheduling
	  • Factors that delay Project Schedule
	  • Principles of Project Scheduling
	  • Project Scheduling Techniques- Concept of Gantt Chart, PERT, CPM
	5.4 Concept of Task Network
	5.5 Ways of Project Tracking
	5.6 Risk Management
	  • What is Software Risk?
	  • Concept of Proactive and Reactive risk strategies
	  • Types of Software Risks
	5.7 Risk Assessment
	  • Risk Identification
	  • Risk Analysis
	  • Risk Prioritization
	5.8 Risk control- Need, RMMM strategy
	5.9 Software Configuration Management (SCM)
	  • Need of SCM
	  • Benefits of SCM
	  • SCM Repository-Functions and Features supported
	  • SCM Process- Change control and version Control
		08	18

06	**Software Quality Management**
	Objectives:-
	  ➢ To develop quality awareness for software products.
	  ➢ To become familiar with the available Quality Standards.
	6.1 Basic Quality Concepts
	6.2 Software Quality Assurance (SQA)
	  • Definition of SQA
	  • SQA Activities
	6.3 Concept of Statistical SQA
	6.4 Quality Evaluation Standards
	  • Six sigma for software - Concept of DMAIC and DMDAV Approach
	  • ISO 9000 for software - concept and major considerations
	6.5 CMMI- CMMI Levels, Process Areas considered.
	6.6 CMMI Vs ISO.
	6.7 McCall's Quality factors.
		06	12

	Total	**48**	**100**

Learning Resources:
1) Books:

Sr. No.	Title	Author	Publisher
1	Software Engineering- A Practitioner's Approach	Roger S. Pressman	TATA McGraw-Hill
2	Software Engineering-Principals and Practices	Rohit Khurana	Vikas Publishing House
3	Software Engineering	Pankaj Jalote	Wiley India
4	Software Engineering	S. A. Kelkar	PHI Learning

Websites:-
www.sei.emu.edu
www.ieee.org
www.rational.com/UML
www.iso9001compliance.com
www.wileyindia.com

Course Name : Computer Engineering Group

Course Code : CO/CM

Semester   : Fifth

Subject Title : Computer Security

Subject Code : 17514

Teaching and Examination Scheme

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

Rationale:

      Computer security is 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 System design principles, and network security principles. It will develop knowledge for security of information and information systems within organizations. It focuses on concepts and method associated with planning, managing, and auditing security at all levels including networks

General Objectives:

Student 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.

Objectives:

To develop following skills:

Intellectual Skills:

* Understand basics of computer security
* Know about security attacks, threats, viruses in computer security
* Will gain knowledge about system and network security
* To understand cryptography and stegnography
* Know web security and O.S hardening

Motor Skills:
- Proper Handling of Computer System.
- Basics knowledge of computer network.

Learning Structure:

Application	Recognize Potential Threats to Confidentiality, Integrity and Availability of Information System and apply basic security design principle and techniques to address threats.

Procedures	Password Selection, O.S 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-viruses, Encryption

Facts	Malware spam, Standard Protocols, Attacks, Intrusion, Viruses, Trojans

Theory:

Topic No	Contents	Hours	Marks
1	**Introduction to computer security and security trends.** **Objectives:** ➢ To understand CIA model. ➢ To identify the risks and threats. ➢ To understand security attacks. 1.1 Definition of Computer Security, Need for security, Security basics: Confidentiality, Integrity, Availability, Accountability, Non-repetition. Example of Security, Challenges for security, Model for Security. 1.2 Risk and Threat Analysis: Assets, Vulnerability, Threats, Risks, Counter measures. 1.3 Threat to Security: Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, steps in attack 1.4 Security attacks: Active and Passive attacks, Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. 1.5 Malware : Viruses, Logic bombs	10	22
2	**Identification, Authentication and Operational Security** **Objectives:** ➢ To understand role of people in security ➢ To study access control methods ➢ To understand biometrics and network security. 2.1 User name and password, Managing passwords, choosing password. 2.2 Role of people in Security: Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software/hardware, Access by Nonemployees, Security awareness, Individual User responsibilities 2.3 Access controls: Definition, principle, policies: DAC, MAC, RBAC. 2.4 Biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes.	10	20
3	**Cryptography** **Objectives:** ➢ To understand cryptography. ➢ To understand transposition techniques ➢ To understand symmetric and asymmetric cryptography 3.1 Introduction : Cryptography, Cryptanalysis, Cryptology, Substitution techniques: Caesar's cipher, monoalphabetic and polyalphabetic, one-time pad. 3.2 Transposition techniques – Rail fence technique, simple columnar, Steganography. 3.3 Hashing – concept 3.4 Symmetric and asymmetric cryptography: Introduction to Symmetric encryption, DES (Data encryption Standard) algorithm, Asymmetric key cryptography : Digital Signature.	08	16

4	**Computer Security Technology and Intrusion Detection** **Objectives:** ➢ To understand Firewall technique ➢ To understand VPN, Kerberos, security topologies ➢ To understand intrusion detection system ➢ To understand email security, IP security 4.1 Firewalls: Need for Firewall , limitations , characteristics. Types of Firewall : Hardware, Software, Packet filter, Proxy Server, Hybrid, Application gateways, circuit level gateway, Implementing Firewall. 4.2 Virtual Private Network work, Kerberos – concept, security topologies: security zones, DMZ, Internet, Intranet, VLAN. 4.3 Intrusion Detection: Intrusion detection systems (IDS), host based IDS, network based IDS, Honey pots . 4.4 Email security : Email security standards : Working principle of SMTP, PEM, PGP, S/MIME. 4.5 IP security: overview, architecture, IPSec Configuration, IPSec Security.	12	24
5	**IT Act and Cyber law** Objectives: ➢ Learn about different cyber crimes ➢ Understand IT acts in India 5.1 Introduction to Deleted File Recovery Formatted Partition Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics. 5.2 Introduction to Cyber Crimes – Hacking, Cracking, Viruses, Virus Attacks, Pornography, Software Piracy, Intellectual property, Legal System of Information Technology, Mail Bombs, Bug Exploits, Cyber Crime Investigation 5.3 Introduction Cyber Laws- Introduction to IT act 2000 and IT act 2008, Introduction to the cyber laws.	04	10
6	**Application and Web Security** **Objectives:** ➢ To understand application hardening and patches. ➢ To understand 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.	04	08
	Total	48	100

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Knowing the security provided with windows operating system(User authentication)	02
2	Recovery the password of windows machines using password recover utility (John the ripper) or any other utility	02
3	Tracing of email origin using eMailTracePro utility	04

4	Tracing the path of an website/ web server using tracert utility	04
5	Install open source Latest version of Cryptool software and Encrypt and decrypt the message using Simple Transposition – Permutation(Cryptool)	04
6	Encrypt and decrypt the message using Caesar Cipher With Variable Key(Cryptool)	04
7	Encrypt and decrypt the message using 3 X 3 Hill Cipher(Cryptool)	04
8	Create Digital Signature document using Cryptool	04
9	Installation and working of Open source Firewall –Free BSD/iptables Firewall	04

Learning Resources:
1. Books:

Sr. No.	Author	Title	Publisher
1	Atul Kahate	Cryptography and Network Security	Tata McGraw Hill
2	William Stallings, Lawrie Brown	Computer Security Principles and Practices	Pearson Education
3	Dieter Gollman	Computer Security	Wiley India Education (Second Edition)
4	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
5	C K Shyamala, N Harini, Dr. T. R. Padmanabhan	Cryptography and Security	Wiley India

2. Website:
   1. http://www.pgpi.org/doc/pgpintro
   2. http://www.emailtrackerpro.com
   3. http://www.kmint21.com
http://www.jjtc.com/Steganography/tools.html

Course Name : Computer Engineering Group

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

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

Subject Title : Java Programming

Subject Code : 17515

Teaching and Examination Scheme:

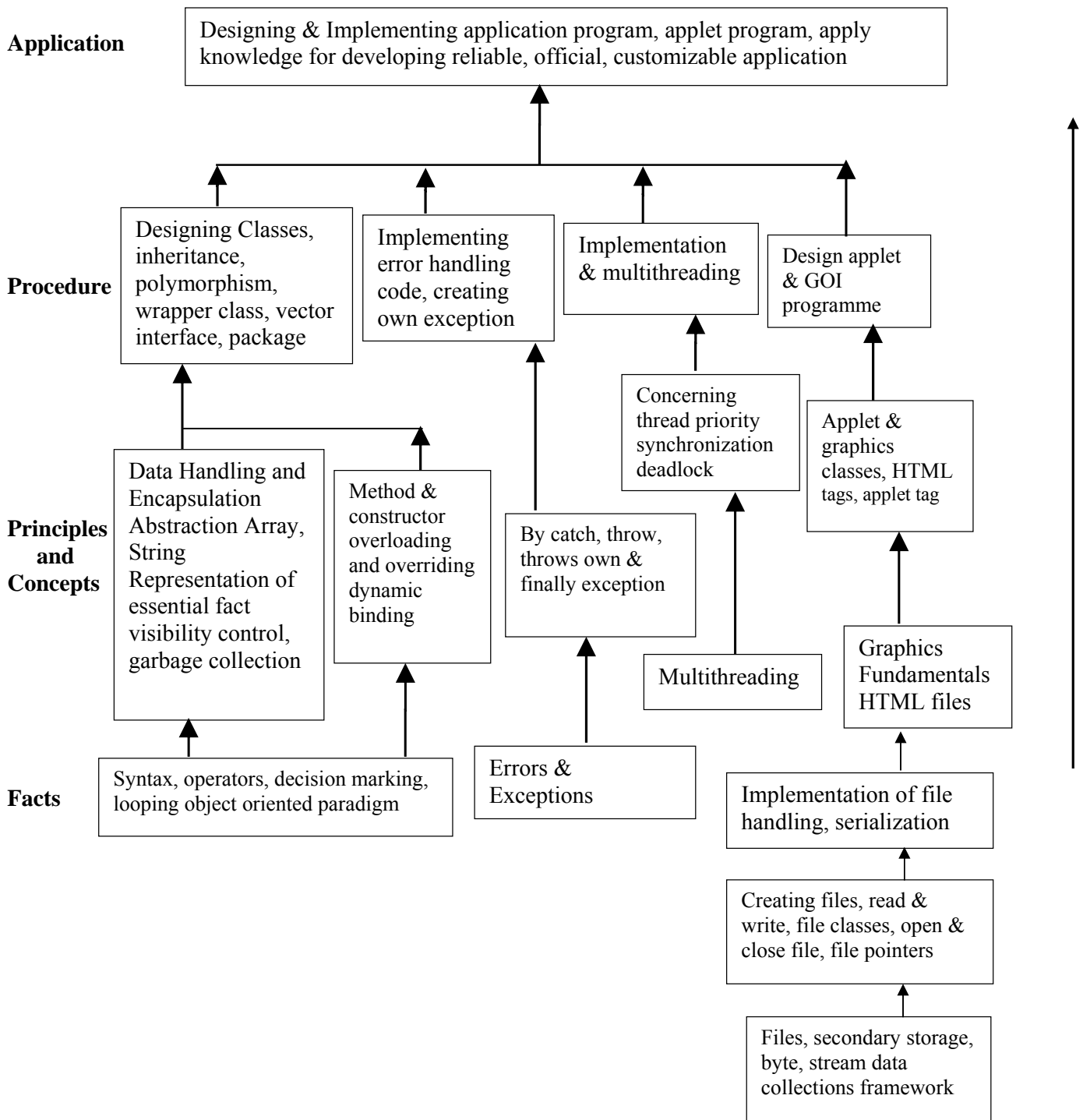| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	---	04	03	100	50#	---	25@	175

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:

        Nowadays, object oriented paradigm is of utmost importance for programming. Java language supports and is a very good means of understanding and implementing the OOP concepts. Java language enables the easy development of robust, secure, reusable and portable application. An application may be a standalone or it may be a web based. This subject provides an insight to understand and implement the OOP concepts, do the applet, graphics and multithreaded programming and Interact with the files. It also builds strong foundation for advanced java programming.

General Objectives:

Intellectual skills:

➢ Use of programming language constructs.

➢ To know apply different logics to solve the given problem.

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

➢ Study different types of errors.

➢ Debugging of programs.

➢ Understand different steps to develop program such as

    a. Problem definition

    b. Analysis

    c. Design of logic

    d. Coding

    e. Testing

    f. Maintenance

Learning Structure:

Application | Designing & Implementing application program, applet program, apply knowledge for developing reliable, official, customizable application |

Procedure

| Designing Classes, inheritance, polymorphism, wrapper class, vector interface, package | Implementing error handling code, creating own exception | Implementation & multithreading | Design applet & GOI programme |

Principles and Concepts

| Data Handling and Encapsulation Abstraction Array, String Representation of essential fact visibility control, garbage collection | Method & constructor overloading and overriding dynamic binding | By catch, throw, throws own & finally exception | Concerning thread priority synchronization deadlock | Applet & graphics classes, HTML tags, applet tag |

| Multithreading | Graphics Fundamentals HTML files |

Facts

| Syntax, operators, decision marking, looping object oriented paradigm | Errors & Exceptions | Implementation of file handling, serialization |

| Creating files, read & write, file classes, open & close file, file pointers |

| Files, secondary storage, byte, stream data collections framework |

Contents:

Chapter	Content	Hours	Marks
01	**Introduction to Java** Specific Objectives: ➤ To understand the features, Data types, Decision making and looping, constructs of java language. 1.1 Java Features and the Java Programming Environment. Object Oriented, Compiled, Interpreted, Platform independent, Portable, Robust and Secure, Dynamic. 1.2 Java Tokens & Data types Constants & Symbolic Constants, variables, dynamic initialization, data types, array & string, scope of variable, type casting, standard default values. 1.3 Operators & Expressions Arithmetic Operators, Relational Operators, Logical Operators, Increment & Decrement, Conditional Operators, Bit wise Operators, Instance of Operators, Dot Operators, Operator precedence & associativity, Evaluation of Expressions, Type conversions in expressions, Mathematical Functions - min(), max(), sqrt(), pow(), exp(), round(), abs(). 1.4 Decision making & looping If statement, if else statement, nested if else statement, if else if ladder, the switch statement, nested switch statement, The ?: operator, The while statement, the Do while statement, the 'for' statement, break, continue & return statement, nested loops, labeled loops, for-each version of the for loop.	08	16
02	**Classes, Objects & Methods** Specific Objectives: ➤ To create classes, objects and make use of arrays and strings. ➤ They will also learn the concepts of inheritance and garbage collection. 2.1 Defining a class, creating object, accessing class members, Constructors & methods, types of constructors, nesting of methods, argument passing the 'this' keyword, command line arguments, varargs: variable-length arguments, garbage collection, finalize() method, the object class. 2.2 Visibility Control Public, Private, Protected, default, friendly private Protected access. 2.3 More on Arrays & Strings Types of arrays, creating an array, strings, string classes & string buffer, vectors, wrapper, classes, enumerated types. 2.4 Inheritance Types of Inheritance, single Inheritance, multilevel Inheritance, Hierarchical Inheritance, method & constructor Overloading & overriding, dynamic method dispatch, final variables, final methods, use of super, abstract methods & classes, static members.	12	24

03	**Interface and Package**
	Specific Objectives:
	  ➢ To create and use interface and packages.
	  ➢ They will also learn the package naming, conventions and about the static import.
	3.1 Interface
	  Define Interface, implementing interface , accessing interface, variables& methods, extending interfaces, interface references, nested interfaces
	3.2 Package
	  Define package, type of package naming & creating packages, accessing package, import statement, static import, adding class & interfaces to a package.
		06	12

04	**Exception Handling & Multithreaded Programming**
	Specific Objectives:
	  ➢ To handle the exceptions in programs effectively.
	  ➢ They will also learn 'how to make their programs multithreaded', set thread priorities, and the concept of deadlock.
	4.1 Errors & Exception
	  Types of errors, exceptions, try & catch statement, nested try statement, throws & Finally statement, build-in exceptions, chained exceptions, creating own exception, subclasses.
	4.2 Multithreaded Programming
	  Creating a Thread: By extending to thread class & by implementing runnable Interface.
	  Life cycle of thread: Thread Methods:
	  wait(), sleep(), notify(), resume(), suspend(), stop().
	  Thread exceptions, thread priority & methods, synchronization, inter-thread communication, deadlock.
		08	16

05	**Java Applets & Graphics Programming**
	Specific Objectives:
	  ➢ The students will be able to write interactive applets and make use of graphics in programming.
	  ➢ They will also learn to change the background and the foreground color and to use the different fonts.
	5.1 Introduction to applets
	  Applet, Applet life cycle (skeleton), Applet tag, Adding Applet
	  To HTML file, passing parameter to applet, embedding <applet>tags in java code, adding controls to applets.
	5.2 Graphics Programming
	  Graphics classes, lines, rectangles, ellipse, circle, arcs, polygons, color & fonts, setColor(), getColor(), setForeGround(), setBackGround(), font class, variable defined by font class: name,
	  pointSize, size, style, font methods: getFamily(), getFont(), getFontname(), getSize(), getStyle(), getAllFonts() & getavailablefontfamilyname() of the graphics environment class.
		10	20

06	**File I/O & collection frame work** Specific Objectives: ➢ The students will be able to work with File IO and collections frame work. ➢ They will also learn the concept of serialization**.** 6.1 File classes Stream classes, byte stream (FileInputStream&FileOutputStream), character stream (FileReader&FileWriter) serialization. 6.2 Introduction to collections frame work Array list, date class, set class, Iterator, map class.	04	12
	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Write a program to create and casting of different variables in JAVA	3
2	Write a program to print all prime numbers between a given range using while, for, do-while loop	3
3	Write a program to check the largest number from three number using nested if-Else with logical operator.	4
4	Write a program create a class "Student" having following attributes 1) studentName 2) rollno 3) branch 4) percentage. Create two methods, one method for I/P data using command line argument and one method for display data on screen.	4
5	Write a program for constructor overloading.	4
6	Write a program for multilevel Inheritance	4
7	Write a program for method overriding in Inheritance	4
8	Write a program for creating vectors to add ix objects and display the size and content of the vector.	4
9	Write a program to use wrapper class method for following conversion 1. Integer value to string 2. Double value to string 3. String value to integer value 4. Integer object to string 5. String to Long object	4
10	Write a program to accept ten numbers in an array and display the number in ascending order.	3
11	Write a program to create a user defined package named "College" which defines one class "student" with suitable data members and "display ()" method. Also declare an interface named "Branch" and abstract method "entry ()". Import the above package in a new class "XYZ".	4
12	Write a program based on user defined Package and interface.	4
13	Write a program to use user defined exception by accepting a number and throw an exception if the number is not a positive number.	4
14	Write a program to create two threads such that one thread print 1 to 10 numbers and another thread print 11 to 20 numbers.	3
15	Write a program that reads all the text from a file named "xyz.txt" and copies it into a new file named "abc.txt".	4

16	Write a program to draw different shapes with different colors using applet Srno. Shape Color 1 Line black 2 Rectangle Red 3 ellipse green 4 arcs yellow 5 triangle[polygon] blue	4
17	Write a program using applet to display "WELCOME TO JAVA" having following parameters 1 font name → "Times New Roman" 2 size → 18 3 style → "BOLD"	4
	Total	**64**

Learning Resources:
Books:

Sr. No	Author	Title	Publisher
1	Junaid Khateel & Dr. G. T. Thampi	Computer Programming in JAVA	DreamTech Press
2	Sharnam Shah & Vaishali Shah	Core JAVA for Beginners	SPD
3	E Balagurusamy	Programming in JAVA a primer	TMH
4	Sachin Malhotra & Saurabh Chaudhary	Programming in JAVA	Oxford University Press
5	Rashmi Kanta Das	Core Java for beginners	Vikas Publishing House Pvt. Ltd

Course Name   **: Diploma in Computer Technology**

Course Code   **: CM**

Semester   **: Fifth**

Subject Title   **: System Programming**

Subject Code   **: 17517**

Teaching and Examination Scheme:

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

NOTE:

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

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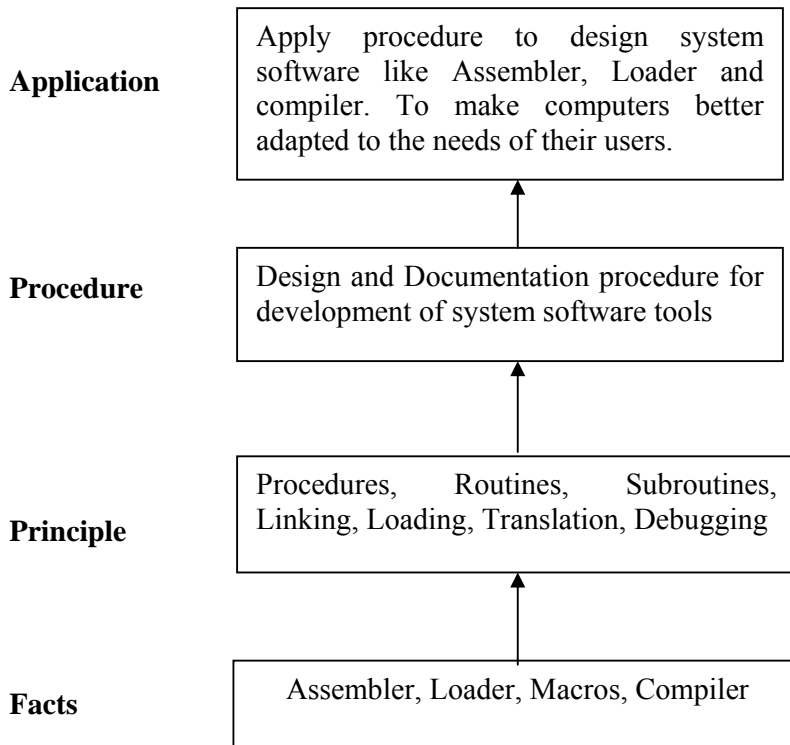
Rationale:

A modern computer has powerful capabilities such as fast CPU, large memory, Input-Output devices and networking support. However, It has to be instructed through the machine language. A common user does not wish to interact with the computer at this level. The System programs are the collection of programs that bridge the gap between the users and the operating system. The main aim of System programming is to understand designing and implementation of software's like assemblers, loaders and compilers. Using system programming students will have an idea about how the system tools coordinates with operating system.

Objectives:

Students will be able to:

➢ Understand the concept of machine structure, machine language and assembly language.

➢ Define symbols, literals, instructions, and assign addresses.

➢ Understand the concept of lexical, syntax and semantic analysis.

➢ Differentiate between procedures and subroutines.

➢ Understand macros, macro call and expansion.

➢ Understand the concepts of Memory allocation, loading and linking.

➢ Understand design of compiler, loader, linker and assembler.

Learning Structure:

Application

> Apply procedure to design system software like Assembler, Loader and compiler. To make computers better adapted to the needs of their users.

↑

Procedure

> Design and Documentation procedure for development of system software tools

↑

Principle

> Procedures, Routines, Subroutines, Linking, Loading, Translation, Debugging

↑

Facts

> Assembler, Loader, Macros, Compiler

Theory:

Topic No	Contents	Hours	Marks
1	**INTRODUCTION TO SYSTEM PROGRAMMING** **Objectives:** ➙ Recognize the need of system programming. ➙ Understand the role of language processors. **1.1** What is System Software? Goals of System Software. **1.2** Components of System Software : Assemblers, Loader, compiler, Macro processor **1.3** Evolution of System Software and Operating System **1.4** Foundations of system Programming, Machine Structure	04	10
2	**ASSEMBLER** **Objectives:** ➙ Introduce Single pass and Two-Pass assembler ➙ Understand the general assembly scheme **2.1** General design procedure **2.2** Design of the assembler :Statement of the problem; Data Structure; Format of databases; Algorithm; Look for modularity **2.3** Table Processing: Searching and Sorting- Linear Search; Binary Search Sorting: Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of sort; Hash or Random entry searching	12	24
3	**MACRO LANGUAGE AND MACRO PROCESSORS** **Objectives:** ➙ Comprehend the definition and expansion of macros instructions ➙ Gain insight into design of macro preprocessor **3.1** Macro Instructions **3.2** Features of a Macro facility - Macro Instruction Arguments; Conditional macro expansion; Macro call within Macros; Macro Instruction defining Macros **3.3** Implementation - Implementation of restricted faculty: Two Pass Algorithm, A Single Pass Algorithm, Implementation of macro calls within Macros, Implementation within an assembler	06	12
4	**LOADERS AND LINKING** **Objectives:** ➙ Understand the concepts and requirements of loading and linking ➙ Gain insight into the design of linker **4.1** Loaders Schemes : "Compile and go" loaders; General Loader Schemes; Absolute Loaders; Subroutine linkages; Relocating loaders; Direct linking loaders; Other loaders scheme: Binders, Linking loaders Overlays, Dynamic Binders **4.2** Design of Absolute loaders **4.3** Design of Direct Linking Loaders: Specification Problem; Specification of data structures; Format of database; Algorithm	10	20

5	**COMPILER**
	Objectives:
	  ➢ Understand the aspects of compilation of high-level languages.
	  ➢ Describe the various phases of compilers.
	  ➢ Discuss about memory allocation scheme used in compilers.
	5.1 Statement of a problem: Recognizing basic elements; Recognizing Syntactic units and Interpreting meaning; Intermediate from: Arithmetic statements, Non-Arithmetic statement, Non-executable statements; Storage Allocation; Code Generation: Optimization(M/c independent), Optimization (M/c dependent); Assembly Phase; General Model of Compiler.
	5.2 Phases of Compiler : Lexical Phase: Tasks, Databases, Algorithm; Syntax Phase: Databases, Algorithm; Interpretation Phase: Databases, Algorithm; Optimization: Databases, Algorithm; Storage Assignment: Databases, Algorithm; Code Generation: Databases, Algorithm; Assembly Phase: Databases, Algorithm; Passes of a Compiler
		12	24

6	**PARSING**
	Objectives:
	  ➢ Identify and understand the role of a lexical and syntax analyzer.
	  ➢ Understand the top-down and bottom-up parsing techniques.
	6.1 Top down parser
	6.2 Bottom up parser
		04	10

	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Write a C program for Interchange sort	02
2	Write a C program for Bucket sort	02
3	Write a C program for Radix Interchange sort	02
4	Write a C program for Address calculation sort	02
5	Write a program for generating a symbol table using Lex/Yacc	04
6	Design of Macro assembler	04
7	Design of Loader	04
8	Write a program to read tokens and print its type using Lex	02
9	Write a program for code generation using Lex/Yacc	04
10	Write a program for identifying loop invariant using Lex/Yacc	04
11	Write a lex program to parse input to check it belongs to given syntax of language	02

NOTE: All Practical to be performed on Linux OS using gcc, Lex and Yacc

Learning Resources:
   3. Books:

Sr. No.	Author	Title	Publisher
1	John J. Donovan	System Programming	Tata McGraw-Hill Edition
2	D.M. Dhamdhere	System Programming and Operating System	Tata McGraw-Hill Edition
3	G.Sudha Sadashiv	Compiler Design	SciTech
4	Rajesh K. Maurya	System Programming	Dreamtech

   4. CDs, PPTs, code Etc.:

   - www.dreamtechpress.com (PPTs available)
   - www.cs.princeton.edu/~appel/modern(for compiler implementation in Java/ML/C)

   5. IS, BIS and International Codes:
         ISBN: 978-81-7596-071-8
         ISBN: 978-81-317-2950-2
         ISBN: 978-81-775-8555-1
         ISBN: 978-81-203-3051-1

Course Name : All Branches of Diploma in Engineering & Technology

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

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

Subject Title : Behavioural Science

Subject Code : 17075

Teaching and Examination Scheme:

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

Rationale:

        With increased globalization and rapid changing business expectations, employers are looking for wide cluster of skills to cater to the changing demand. Personality traits and soft skills are playing a key role in a student's career in this changing scenario. Corporate houses look for soft skills that supplement hard skills.
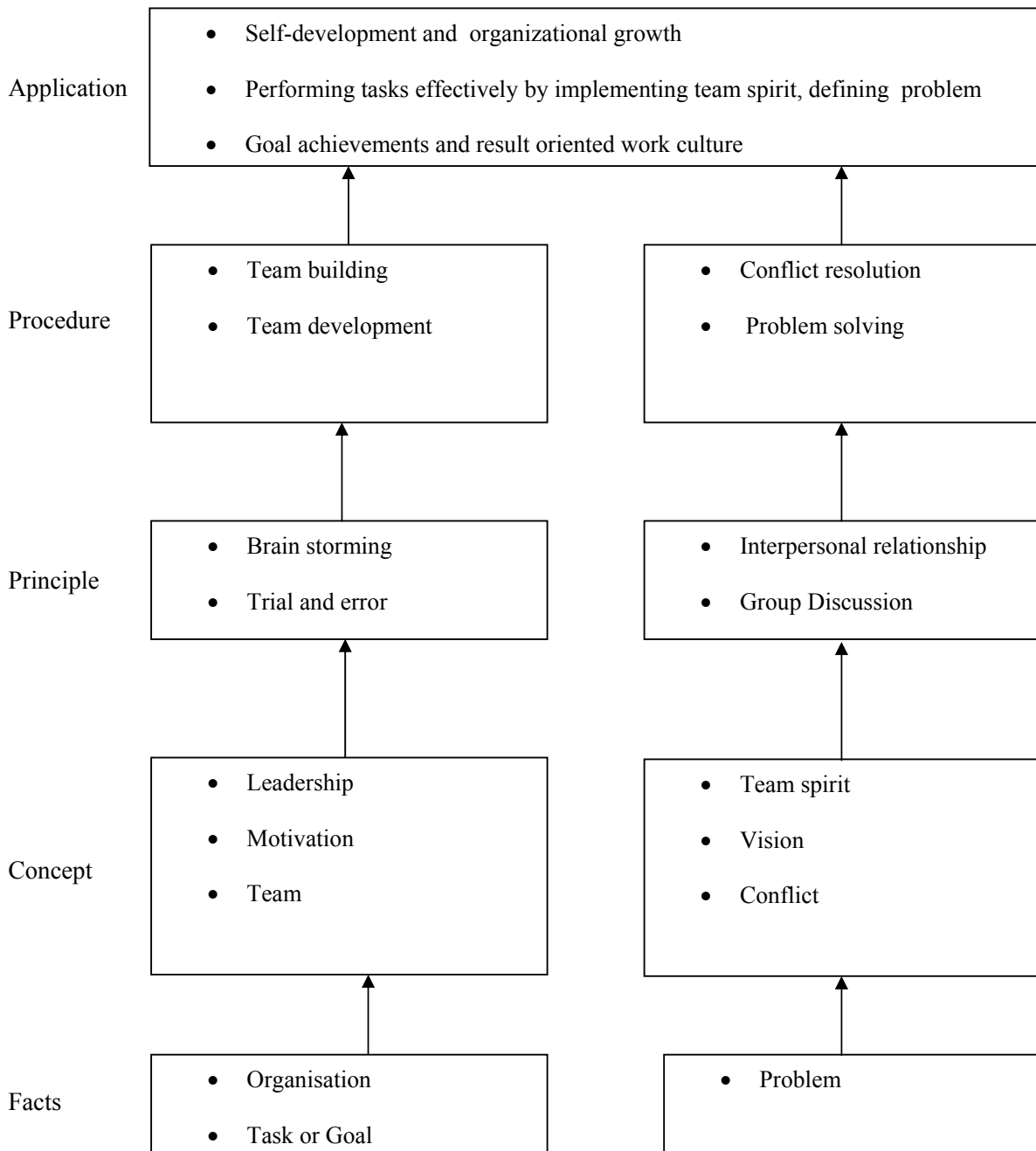
        Addition of behavioural science in curriculum is intended to enhance the efficiency of a person so that he can contribute to overall growth of organisation. It aims at developing insight into leadership, team building, motivation, interpersonal relationship, problem solving, decision making and aspects of personality in a technician's profile. Addition of the topic of organizational culture will further mould him/ her in the organisational role.

        This subject of 'Behavioural Science' provides a broad base in which a technician can develop a successful career in the world of work.

General Objectives:

After studying this subject, the students will be able to:

1. Develop him/her as Team leader.

2. Use self-motivation and motivate others.

3. Build a team and develop team spirit among the team members.

4. Improve the interpersonal relationship skills.

5. Learn Problem solving and decision making skills.

6. Discuss a particular topic in a group and face the interview.

Learning Structure:

Application
| • Self-development and organizational growth |
| • Performing tasks effectively by implementing team spirit, defining problem |
| • Goal achievements and result oriented work culture |

Procedure

| • Team building | • Conflict resolution |
| • Team development | • Problem solving |

Principle

| • Brain storming | • Interpersonal relationship |
| • Trial and error | • Group Discussion |

Concept

• Leadership	• Team spirit
• Motivation	• Vision
• Team	• Conflict

Facts

| • Organisation | • Problem |
| • Task or Goal | |

Theory:

Topic and Contents	Hours

Topic 1: LEADERSHIP
Contents:
  1.1 Introduction – Importance, examples of different types of leaders.
  1.2 Meaning and Definition of Leadership.
  1.3 Leadership qualities – Confidence, Vision, Communication Skills, influencing people etc.
  1.4 Types of Leadership styles, their advantages and disadvantages – Autocratic, Democratic, Delegative, Bureaucratic and Laizze Fairie.
	02

Topic 2: MOTIVATION
Contents:
  2.1 Meaning and Definition of motivation.
  2.2 Types of motivation.
  2.3 Maslow's Motivation theory.
  2.4 Job characteristic model to enhance motivation.
	03

Topic 3: TEAM BUILDING
Contents:
  3.1 Definition of Team.
  3.2 Difference between Group and Team.
  3.3 Need for formation of good team (vision, trust, cooperation, initiative, etc.)
  3.4 Approach to Team building (Personality based, activity based, skill based, problem solving based, etc.)
	02

Topic 4: CONFLICT RESOLUTION
Contents:
  4.1 Definition of Conflict.
  4.2 Types of Conflict – Functional and Dysfunctional
  4.3 Sources of Conflict – Ego, Authority, Frustration etc.
  4.4 Positive and Negative effects of conflicts.
  4.5 Methods of Conflict resolution – Compromising, withdrawal, forcing.
	04

Topic 5: PROBLEM SOLVING AND DECISION MAKING
Contents:
  5.1 Steps in Problem Solving.
  5.2 Methods used for solving problems – trial and error method, brain storming, lateral thinking method.
  5.3 Techniques used for Decision making- Decision tree, Decision Matrix, Mind Mapping etc.
	03

Topic 6: GROUP DISCUSSION AND INTERVIEW TECHNIQUES
Contents:
  6.1 GROUP DISCUSSION
    • Objectives of Group Discussion (ability to work in team, speaking and listening skills, leadership, creativity)
    • Does and Don'ts of Group Discussion.
    • How to conclude Group Discussion.
	02

6.2 INTERVIEW TECHNIQUES • Types of Interviews. (patterned, stress, behavioural) • Dress Code, Body Language and Communication Skill. • Probable questions for Interview. • Telephonic or Video Interview.		
	Total	**16**

Practical:
Skills to be developed:

Intellectual Skills:
- Develop ability to find his strengths.
- Select proper source of information.
- Follow the technique of time and stress management.
- Set the goal.

Motor Skills:
- Follow the presentation of body language.
- Work on internet and search for information.
- Prepare slides / transparencies for presentation.

List of Practicals / activities:
1. Form a group of 4 or 5 students and discuss the topic 'Qualities of an effective leader'. Each group will prepare its list with justification to the entire class and write an assignment under the guidance of subject teacher.
2. Form a pair of student and each one from pair will ask each other questionnaire on motivation, self-motivation, experiences that motivated him or other which him for success in the past and write an assignment under the guidance of subject teacher based on discussion.
3. Form a group of 4 or 5 students and assign them a group activity such as 'making a shape from match stick (50 to 100 match sticks) without guidance and without group discussion.
4. The group as in activity 3 will now perform the same activity. After group discussion and under guidance of subject teacher, each student from a group will write an assignment for both the activities and write their inferences with reference to group discussion, team development, team building, etc.
5. Form a group of 8 to 10 student and arrange a group activity such as;
   - Industrial visit.
   - Visit to any historical place/fort/museum, etc
   - Housekeeping and cleaning of any laboratory/seminar hall for any function.
   After the execution of activity student will write an assignment under guidance of teacher keeping in mind individual role, purpose of activity, inter dependency of work or task, coordination of person and task involved and final performance.
6. Write an assignment on interpersonal relationship and conflict management with student's personal experience of solving conflicts.
7. Form a group of 20 students and ask them to prepare a list of 8 to 10 problems affecting the institute. Subject teacher should analyze one such problem on black board using 'Fish bone technique' with the participation of students. Students will write an assignment consisting;
   - Apparent problem statement.
   - Analysis of the causes.

- Definition of real problem.
8. The subject teacher starts the session with 'Statement of the problem' written on the black board. After ensuring that all the participants are at the same level of understanding the statement of problem, he initiates NGT (Normal Group Technique) to arrive at maximum possible number of creative solutions.

   Based on ranking matrix the group will arrive at feasible solutions and students will write an assignment consisting of;
   - Problem Statement.
   - Model of problem solving.
   - List of creative solution suggested by participants.
   - Write the most feasible solution based on given criteria.
9. Form a group of 4 to 5 students and give them a topic for GD for 10 to 15 minutes. Teacher should analyse GD on certain parameters and students will write an assignment on aspects of GD and prepare a format (suggested or designed by teacher) which gives details of GD carried out.
10. Arrange a guest lecture of H.R. Person from industry/expert in interview technique and conduct mock interview of each student. Student should write a report on this activity.
11. Arrange a visit to industry and gather information about organisation, product, turnover, work culture, vision/mission statement, quality policy, Corporate social responsibility etc and write a report on it.

Note - Subject teacher shall guide the students in completing the assignments based on above practicals.

Learning Resources:
Books:

Sr. No.	Author	Name of Book	Publication
1	Subject Experts-MSBTE	Handbook and assignment book on Development of Life Skills-II	MSBTE
2	Dr. Kumkum Mukherjee	Principles of management and organizational behaviour	Tata McGraw Hill Education Pvt Ltd.
3	Dr.T.Kalyana Chakravarti Dr.T.Latha Chakravarti	Soft Skills for Managers	Biztantra
4	Barun K Mitra	Personality Development and soft skills	Oxford University Press
5	Priyadarshini Patnaik	Group discussion and interview skills	Foundation Books

Course Name : Computer Engineering Group

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

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

Subject Title : Network Management and Administration

Subject Code : 17061

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	04	--	--	50#	--	25@	75

Rationale:-

        The world in the information era has become network centric. It provides comprehensive, self-contained tour of information which deals with data transmission and wiring, network technologies and internetworking protocols.

        This subject provides the right balance between theoretical background and practical aspects of network. It is designed for the students to understand basics of computer network, but who want to begin an education about network management and administration.

        Network manager is responsible for management of network system, applications in data and telecommunication services whereas network administrator is responsible for operations of key parts of the network.

        The contents of the subject cover installation and configuration of network operating system and server which enables the students to manage and administer the network resources.
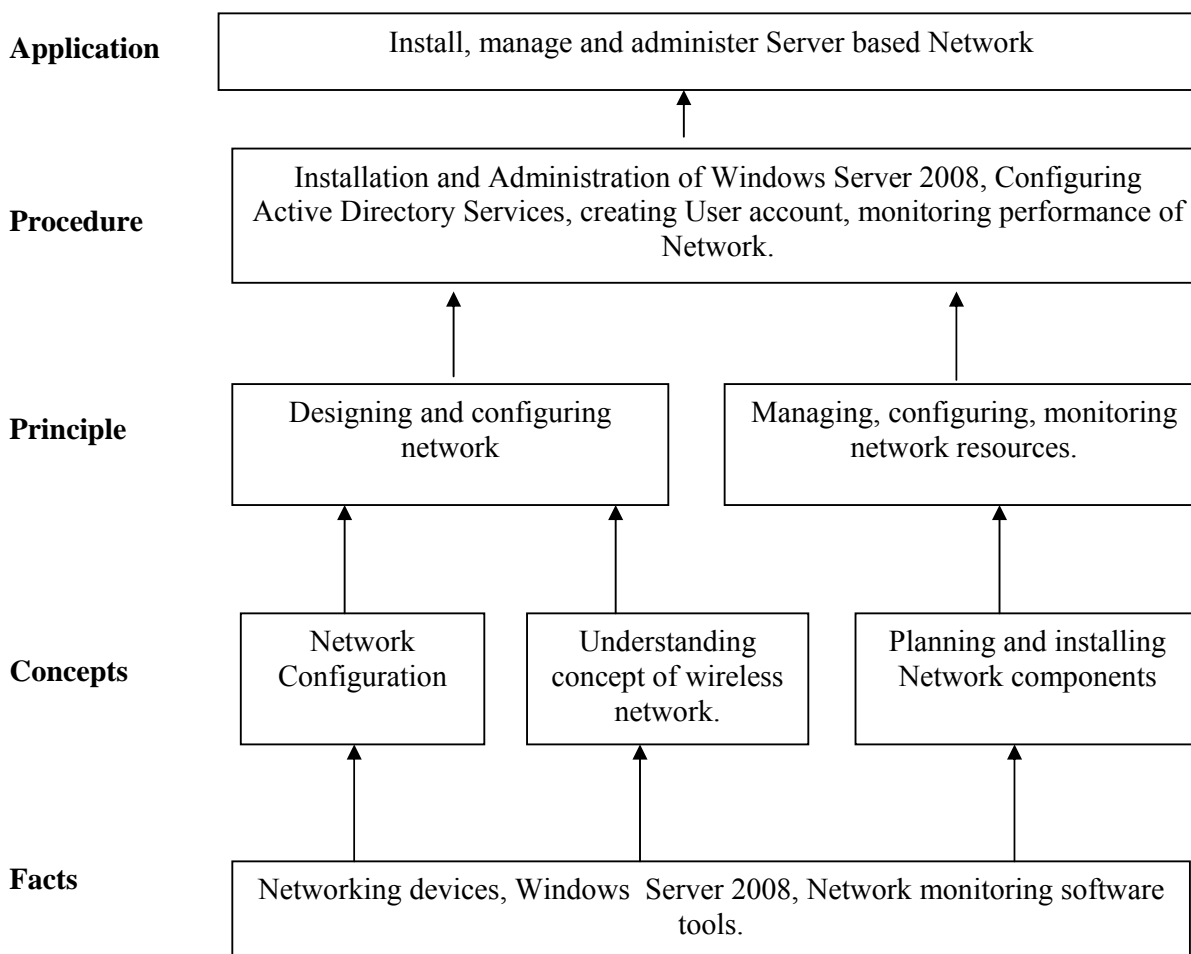
Objectives:-
Intellectual Skills:

     Students will be able to

1. Identify different network components.
2. Install, manage and administer the network.
3. Understand requirements of Windows Server 2008.
4. Use of resource sharing on network.
5. Manage different roles of Servers.

Motor Skills:

1. Handling of Computer systems.
2. Handling of different network devices.

Learning Structure:

Application	Install, manage and administer Server based Network
Procedure	Installation and Administration of Windows Server 2008, Configuring Active Directory Services, creating User account, monitoring performance of Network.
Principle	Designing and configuring network Managing, configuring, monitoring network resources.
Concepts	Network Configuration Understanding concept of wireless network. Planning and installing Network components
Facts	Networking devices, Windows Server 2008, Network monitoring software tools.

Contents:

Topic No.	Name of the Topic	Hours

01	**Concepts Of Networking**
	Objectives:-
	  ➤ To understand basic hardware & software requirement for building a network.
	1.1 Network configuration- Peer-to-Peer Network, Server based Network
	  - Network Topologies & Types.
	  - Basic Network Media.
	1.2 Planning & Installing Network Hardware
	  - Types of Server- File, Print, Mail, Web & Database Servers.
	  - Installing a NIC, Twisted Pair Cable, fiber optic Cable, Switches etc.
		02

02	**Windows Server 2008**
	Objectives:-
	  ➤ To understand Network operating System & Concept of Active Directory Services.
	2.1 Installing & Configuring Windows Server
	  - Checking System Requirements.
	  - Choosing a File System.
	  - Planning Partitions.
	  - Deciding TCP/IP Configuration.
	  - Choosing Workgroups or domains.
	2.2 Dealing with Directory Services
	  - Define directory services, (NDS), Windows NT Domains, Microsoft Active Directory Service (ADS), X.500 Directory Access Protocol (DAP), and LDAP.
	  - Understanding ADS Structure, Objects, Domains, Organizational Units (OU), Trees, Forests.
		04

03	**Managing User Accounts & Resource Services**
	Objectives:-
	  ➤ Managing user accounts, shared folders and network printers.
	3.1 Understanding user accounts
	  - Creating a new user.
	  - Setting user properties.
	  - Deleting or disabling user accounts.
	  - Working with groups:- Group types, Group Scope, Creating a Group & adding member to a Group.
	  - Understanding Group Policies.
	3.2 Managing Resource Services
	  3.2.1 Managing File Server:
	    - Understanding permissions, sharing files & folders, configuring File Server.
	  3.2.2 Managing Print server:
	    - Network Printing Process.
	    - Managing Shared Printer.
	    - Adjustment Print Server settings.
		04

04	**Configuring DHCP And DNS**
	Objectives:-
	  ➢ To understand configuration of DHCP and DNS.
	 4.1 DHCP (Dynamic Host Configuration Protocol)
	  - Understanding DHCP- IP Address Assignment, DHCP Architecture.
	  - Working with DHCP Server – Installing, configuring and managing DHCP Server.
	 4.2 DNS (Domain Name System) –
	  - Understanding DNS Names- Domain, domain-naming, top level domains, sub-domains, Name Resolution.
	  - Managing DNS server and DNS Clients
		03

05	**Network Administration And Security** **Objectives:-** ➢ To understand network administration and maintaining security. 5.1 Role of Network Administrator. 5.2 Use of Software tools for monitoring & administration of Network. 5.3 Securing user accounts. 5.4 Securing the Network using Firewall, Disabling unnecessary Services. 5.5 Role of SNMP in Network Management. 5.6 Working with Windows-2008 backup software.	03
	Total	**16**

List of Practicals:-

Sr. No.	Name of Practical	No. of Hours
1	Study Network of your laboratory and list following terms- 1. Hardware components and their specification. 2. Network configuration- Peer to peer , client-server network 3. Software requirements 4. List network topology used in the laboratory	04
2	Design and install TCP/IP LAN in laboratory. 1. Design Peer to Peer type of network. 2. Select appropriate topology 3. Install network hardware.	04
3	Install and configure Windows Server 2008 1. Check system requirement. 2. Choose appropriate file system 3. Plan for the partitions. 4. Set TCP/IP configuration. 5. Choose workgroup or domain.	06
4	Install Active Directory Service. 1. Design ADS structure. 2. Create a single domain forest 3. Create an organizational Unit.	06
5	Creating and managing User Accounts. 1. Create new user account. 2. Set user account properties. 3. Create a new Group. 4. Add new user to a group. 5. Delete existing user account.	04
6	Manage Shared Folders 1. Create shared folder	04

	2. Set shared permissions. 3. Use shared folder wizard to configure and manage file server.	

7	Configure and manage Print Services
	  1. Print services such as print spooler, Print drivers.
	  2. Use Print Management Console (PMC).
	  3. Add printer using active directory search.
	  4. Adjust and manage print server and printer properties.
		06

8	Set up DNS(Domain Name System) Server
	  1. Install DNS server on Windows Server 2008
	  2. Use DNS management console to manage DNS server.
	  3. Configure DNS client
	  4. Name resolution.
		06

9	Install and configure DHCP Server.
	  1. Understanding DHCP
	  2. Install and configure DHCP server
	  3. Managing the DHCP server
	  4. Configure DHCP client
		04

10	Tuning and monitoring network system
	  1. Monitoring system with event viewer
	  2. Monitoring network performance using tools
	  3. Understanding and configuring Event log properties.
		06

11	Working with Windows Server 2008 Back up utitilities and services
	  1. Understand backup software and types of backups
	  2. Backing up and restoring server, files and folders
	  3. Creating and restoring Active directory backup.
		06

12	Study of wireless network
	  1. Study of Ad-hoc wireless network
	  2. Wireless network adapter and access points
	  3. Configuring wireless Access Points
		04

13	Study of Cloud Computing as Network Infrastructure Component
	  1. Study of Grid computing
	  2. cloud Structure
	  3. Essentials and benefits of cloud.
		04

Learning Resources:

  I.   Books:

Sr. No.	Author	Title	Publisher
1.	Mark Minasi	Mastering Windows Server 2008	Wiley India
2.	Hassell	Windows Server 2008 : definitive guide	Oreilly
3.	Doug Lowe	Networking for Dummies	Wiley India
4.	Richard Burke	Network Management Concepts and practice.	Pearson
5.	Microsoft Press	MCSE Training Kit	Tata Mc graw Hill
6.	George Reese	Cloud Application architectures	Oreilly

  II.   Web References:

  1. www.snmp.com
  2. www.triti.com
  3. www.cisco.com

Course Name : Computer Engineering Group

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

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

Subject Title : Professional Practices-III

Subject Code : 17062

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	02	--	--	--	--	50@	50

Rationale:

      A recent global research report has indicated that the Indian IT industry and academic institute are expecting multifold growth in technical communication. An effective technical communication helps students to express their ideas either orally or in writing technical reports.
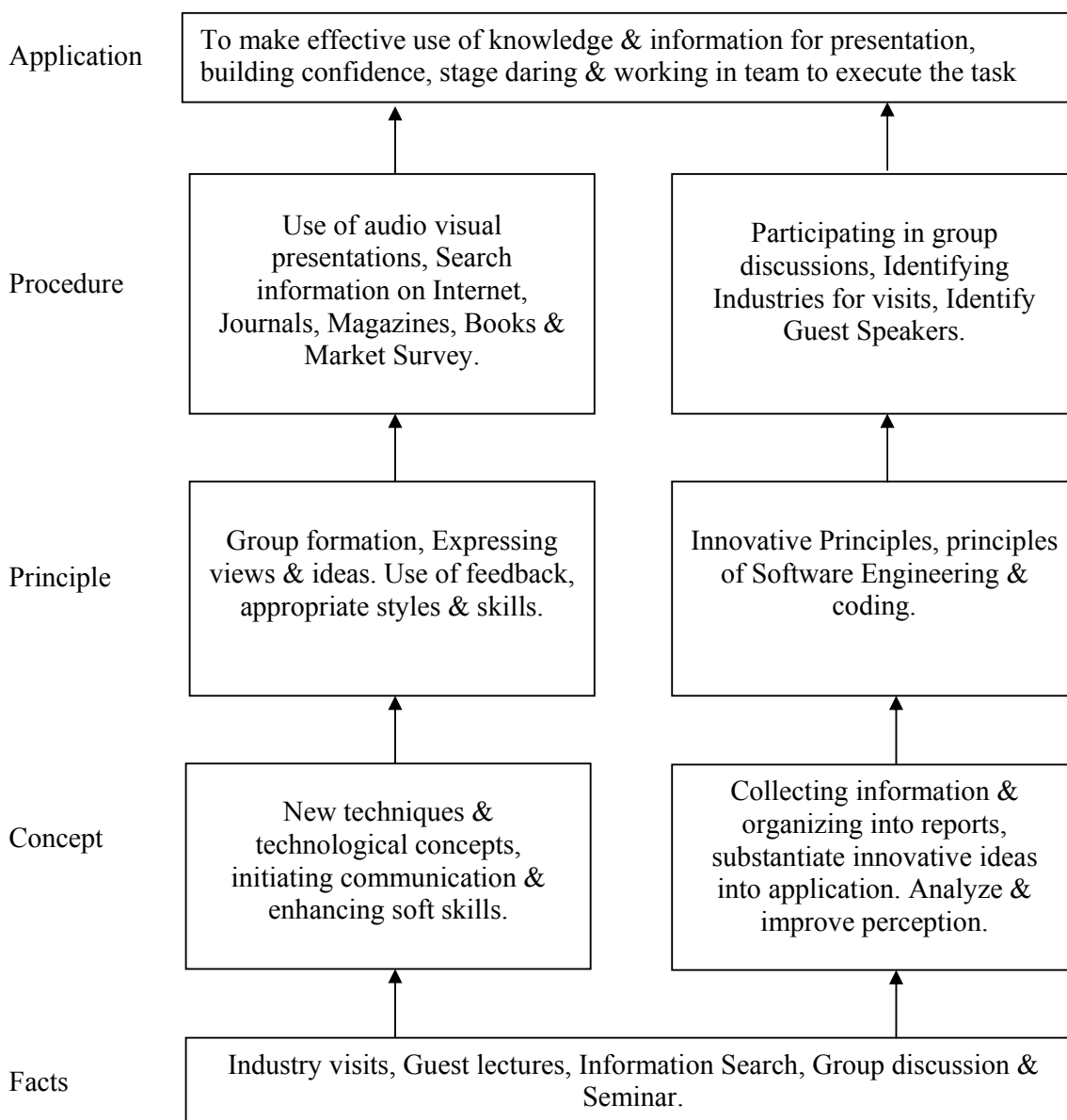
      Man's main task in life is to give birth to himself to become what he potentially is. The most important product of his effort is his own personality. Professional Practices helps to develop student's personality to get acquainted with industrial environment. This content enhances the students for sharing knowledge technical competency, aiding education & information of career opportunity.

      Bigness comes from doing many small things such as Industrial visits, Expert lectures, Seminars on technical topics, group discussions and by using techniques of information search which helps the students to bridge the gap between industry and institute environment.

Objectives:

Intellectual Skills:

Students will be able to:

1. Acquire Information & Knowledge from different resources

2. Write the reports Industry Visits & Guest Lectures.

3. Deliver Seminars on a given topic which will help them to build self confidence & Knowledge.

4. Interact with each other through group discussion.

5. Present the feedback of various activities.

Learning Structure:

Application	To make effective use of knowledge & information for presentation, building confidence, stage daring & working in team to execute the task

Procedure	Use of audio visual presentations, Search information on Internet, Journals, Magazines, Books & Market Survey.	Participating in group discussions, Identifying Industries for visits, Identify Guest Speakers.
Principle	Group formation, Expressing views & ideas. Use of feedback, appropriate styles & skills.	Innovative Principles, principles of Software Engineering & coding.
Concept	New techniques & technological concepts, initiating communication & enhancing soft skills.	Collecting information & organizing into reports, substantiate innovative ideas into application. Analyze & improve perception.

Facts	Industry visits, Guest lectures, Information Search, Group discussion & Seminar.

Contents:

Activity	Name of Activity
01	**Industry Visit : (At least One)** Industry visit should be arranged and each student should submit the technical report individually as a part of term work. Visits can be arranged in any industry which focuses on computer automation, data processing, computer network and computer control machine.

02	**Guest Lectures : (Any Two)**
	    Guest lectures by industry experts, other professional are to be arranged from the following topics or any other suitable technical area. The brief report is to be submitted by individual student as part of term work.
	  a. 3 – D animation techniques.
	  b. Stress management.
	  c. IT Act 2008.
	  d. Linux installation & administration.
	  e. Resume writing & preparation of C.V.
	  f. Introduction of "Python" programming language.
	  g. Career opportunities in IT industry.
	  h. Plastic Memory
	  i. Psychological Personality Development.
	  j. Managing emotional quotient
	  k. Internet Marketing.

03	**Information Search: (Any Two)**
	Form a group of 2 students. Information should be collected from various resources like Internet, books, journals etc.on the following allocated topics or any other suitable topic suggested by teacher.
	Prepare Individual technical report on selected topics of 8-10 pages & deliver seminar on at least one topic.
	  a. Android O.S. of mobile systems.
	  b. Autonomic computing to manage complexity of network components.
	  c. Cloud computing – application (any one).
	  d. Biometrics – in secure E-transactions.
	  e. Pervasive Computing
	  f. E – MINE: A novel web mining approach
	  g. 4 G wireless systems
	  h. Jini – advanced set of network protocols
	  i. Parasitic Computing
	  j. E – wallet
	  k. Nano – technology and applications
	  l. DNA computing
	  m. Artificial neural networks & their applications.

04	**Group Discussion : (Any One)**
	Form a group of 5 students and write a brief report on selected topic as a part of term work.
	
	Some of the suggested topics:-
	  a. Role of UN in peace keeping
	  b. Effect of cinema on youth
	  c. Government contribution to IT
	  d. Balance between professionalism & family
	  e. Position of women India compare to other nations

	f. Present state of Indian Cricket Team g. Is globalization really necessary? h. Is India growing spiritually? i. Any other suitable topic.
05	**Prepare Yourself : (Any Two)** Preparation towards Interview. Write a brief report on selected topic as a part of term work. a. Mock Interview b. Mock aptitude test & puzzle solving.(Attach answer paper) c. CV Preparation.(Attach CV).
06	**Seminar:** Form a group of 4 students Seminar should be on Final year Industrial Project synopsis & week wise plan for completion of project. Each student shall submit a report of at least 10 pages and deliver a seminar.

References:
1. Books on personality development & soft skills.
2. Engineering Subjects Reference books.
3. Journals & Magazines –IEEE journals, IT Technologies, PC Quest, Linux for You, CSI, Computer Today etc.
4. Local News Paper.
5. Books on General Knowledge, Aptitude Test, Puzzle Solving by – R .S. Agarwal, Shakuntala Devi
6. Websites - www.groupdiscussion.com
          - www. Seminarprojects.com

Industrial Training (Optional)

- Students who have completed industrial training in summer vacation after 4th Semester will be granted exemption for activities related to topic 1 to 4.

- These students shall submit report of Industrial training signed and certified by authorities from Industry. Student will give seminar on industry training attended by him.

- Evaluation will be done on seminar and report submitted by student.