**MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI**

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

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**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 | Abbre viation | SUB CODE | TEACHING SCHEME | | | EXAMINATION SCHEME | | | | | | | | | SW (17500) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PAPER HRS. | TH (1) | | PR (4) | | OR (8) | | TW (9) | | |
| | | | | TH | TU | PR | | Max | Min | Max | Min | Max | Min | Max | Min | |
| 1 | Operating System β | OSY | 17512 | 03 | -- | 02 | 03 | 100 | 40 | -- | -- | -- | -- | 25@ | 10 | 50 |
| 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 | Behavioural Science $ | BSC | 17075 | 01 | -- | 02 | -- | -- | -- | -- | -- | 25# | 10 | 25@ | 10 | |
| 6 | Windows Programming Using VC++ | PWV | 17076 | 01 | -- | 02 | -- | -- | -- | 25# | 10 | -- | -- | 25@ | 10 | |
| 7 | Network Management and Administration β | NMA | 17061 | 01 | -- | 04 | -- | -- | -- | 50# | 20 | -- | -- | 25@ | 10 | |
| 8 | Professional Practices - III / Industrial Training (Optional)** β | PPT | 17062 | -- | -- | 02 | -- | -- | -- | -- | -- | -- | -- | 50@ | 20 | |
| | | | **TOTAL** | **15** | **--** | **18** | **--** | **400** | **--** | **125** | **--** | **25** | **--** | **200** | **--** | **50** |

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

**THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.**

Total Marks **: 800**

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

β - Common to IF/CM/CW/CD

**** Students who have done Industrial Training of four week after fourth semester examination during summer vacation will be exempted from some of the activities of Professional Practices-III of fifth Semester and Assessment of Industrial Training will be done in fifth semester under Professional Practices-III**

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**

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

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

**Subject Title : Operating System**

**Subject Code : 17512**

**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.

**Contents: Theory**

| Topic No. | Contents | Hours | Marks |
|---|---|---|---|
| 01 | **Introduction:**<br>**Objectives:**<br>➢ Distinguish between various generation of computer.<br>➢ Classify different types of operating system.<br>1.1 Operating System - Evaluation, Generations $1^{st}$, $2^{nd}$, $3^{rd}$<br>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**:<br>**Objectives:**<br>➢ State services & functions of Operating Systems.<br>➢ Use system calls<br>➢ Distinguish between different kernel architecture.<br>2.1 Different Services of Operating System.<br>2.2 System Calls- Concept, Types and Uses<br>2.3 Simple Structure, Layered, Monolithic, Microkernel.<br>2.4 Components activities- Process Management, Main Memory Management, File Management, I/O System management, Secondary storage management. | 08 | 18 |
| 03 | **Process Management** :<br>**Objectives:**<br>➢ Describe Process, process scheduling, schedulers.<br>➢ Describe inter-process communication & synchronization.<br>➢ Describe critical section problem & solution to ensure the consistency of shared data<br>➢ Describe multithreading models.<br>3.1 Process-Concept, process states, Process Control Block.<br>3.2 Process Scheduling- Scheduling Queues, Schedulers, Context switch.<br>3.3 Inter-process communication- Introduction, shared memory system & message passing system, critical section problem, semaphores.<br>3.4 Threads - Benefits, users and kernel threads, Multithreading Models - Many to One, One to One, Many to Many. | 10 | 22 |
| 04 | **Scheduling :**<br>**Objectives:**<br>➢ Describe CPU scheduling.<br>➢ Describe various CPU-scheduling algorithms.<br>➢ Solve problems based on them.<br>➢ Describe deadlock and its algorithm.<br>4.1 Scheduling & its types - Objectives, concept, CPU and I/O burst cycles, Pre-emptive, Non- Pre-emptive Scheduling, Scheduling criteria.<br>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<br>4.3 Deadlock - System Models, Necessary Conditions leading to Deadlocks, Deadlock Handling - Preventions, avoidance, Banker's algorithm | 10 | 20 |

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

1. Understand concept structure of Operating System.
2. Implement the general purpose commands
3. Implement the radix interchange sort algorithm using 'C'
4. Implement address calculation sort algorithm using 'C'
5. Implement program for generating symbol table using 'C'.
6. Explore macro for a single pass assembles.
7. Explore compile & go loader.
8. Implement program to read & print its type using Lex.
9. Implement program for code generator using Lex / Yacc.
10. Implement a program for identifying Loop invariant using Lex / Yacc.
11. Implement a program to parse input to check that if belongs to given syntax of language using Lex.

**Learning Recourses:**

**1. Books:**

| Sr. No | Book Title | Author | Publication |
|---|---|---|---|
| 01 | Operating System Concepts-VIII$^{th}$ 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-3$^{rd}$ 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.

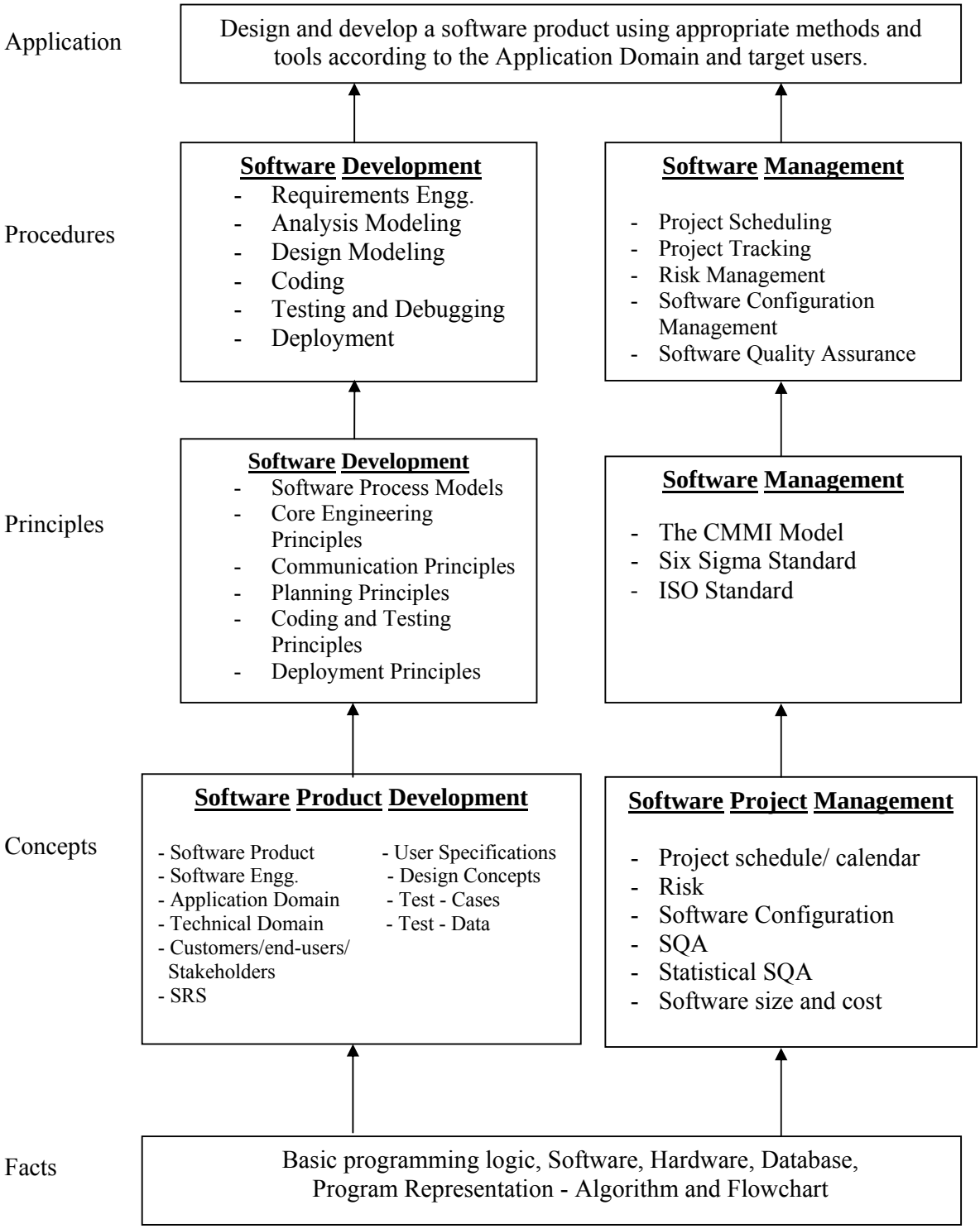
**Objectives:**

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:**



**Contents: Theory**

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

| | | | |
|---|---|---|---|
| 02 | **Software Engineering Practices And Software Requirements Engineering**<br>**Objectives:-**<br>➢ To become familiar with the standard Software Engineering Practices.<br>➢ To understand to carry out Requirements Engineering Tasks.<br>➢ To understand the importance of the SRS Document in the software Project.<br>2.1 Software Engineering Practices - Definition, Importance, Essence<br>2.2 Core Principles of Software Engineering (Statements & Meaning of each Principle)<br>2.3 Communication Practices (Concept, Need of Communication, Statements and Meaning of each principle)<br>2.4 Planning Practices (Concept, Need of Planning, Basic Activities included, Statements and Meaning of each principle)<br>2.5 Modelling Practices<br>• Concept of Software Modelling<br>• Analysis Modelling ( Concept, Name of the analysis domains represented, Analysis Modelling Principles - Statements & Meaning of each principle<br>• Design Modelling ( Concept, Name of the three design aspects, Design Modelling Principles - Statements & Meaning of each principle)<br>2.6 Construction Practices<br>• Concept of Software Construction<br>• Coding (Concept, Preparation Principles, Coding Principles, Validation Principles)<br>• Testing (Concept, Testing Principles)<br>2.7 Software Deployment<br>• Concept of Delivery Cycle, Support Cycle & feedback Cycle<br>• Deployment Principles- statements & meaning of each principles<br>2.8 Requirements Engineering<br>• Concept of Requirements Engineering<br>• Requirement Engineering Tasks (Concept and sub-tasks included)<br>2.9 SRS (Software Requirements Specifications)<br>• Concept of SRS<br>• General Format of SRS<br>• Need/Importance of SRS | 06 | 16 |
| 03 | **Analysis And Design Modelling**<br>**Objectives:-**<br>➢ To understand to build Analysis Model for a Software.<br>➢ To understand to apply design concepts and to build design | 12 | 18 |

| | | | |
|---|---|---|---|
| | elements<br>3.1 Analysis Modelling<br>• Concept and need of Analysis Modelling<br>• Objectives of Analysis Modelling<br>3.2 Analysis Modelling approaches<br>• Structured Analysis (Concept)<br>• Object Oriented Analysis (Concept)<br>3.3 Domain Analysis<br>• Concept of Technical Domain of the software (to be discussed with examples)<br>• Concept of Application Domain of the Software (to be disscussed with the examples: Finance & Banking, Hospitability, Health care, Embeded Software, Inventory System, etc.)<br>• Goals<br>• Inputs and Output of Domain analysis<br>3.4 Building the Analysis Model<br>• Data Modelling Concepts<br>( Meaning of the Terms- Data Objects, Data Relationships, Data Attributes, Cardinality & Modality with Examples)<br>• Flow- Oriented Modelling<br>- DFD ( Use, Standard Notations, Rules to be followed, DFD Construction – Using any case Study)<br>- Data Dictionary( Concept, Use, contents to be incoporated, Advantages)<br>- Creating a Control Flow Model ( Nature of software applications where it is required and used, Guidelines used for creating the model)<br>- Creating Control Specifications (CSPEC)<br>- Creating Process Specifications (PSPEC)<br>• Scenario- Based Modelling<br>- Developing Use Cases<br>- What is a Use Case?<br>- Purpose of a Use Case<br>- Use Case Diagram<br>• Creating a behavioural model<br>- Concept<br>- General Steps involved<br>3.5 Design Modelling<br>• Design Process<br>- Concept of Software Design<br>- Design Quality Guidelines<br>• Design Concepts<br>• 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<br>3.6 The Design model<br>• Data Design Elements<br>• Architectural- Design elements | | |

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

| | | | |
|---|---|---|---|
| 05 | **Software Project Management**<br>**Objectives:-**<br>➢ To understand the importance of Project Scheduling.<br>➢ To become familiar with Project Scheduling Techniques.<br>➢ To understand the concept of software risks and Risk Managemant.<br>➢ To understand the importance of Software Configuration Management.<br>5.1 Introduction to Software Project Management and its need.<br>5.2 The Management Spectrum – 4 Ps and their Significance<br>5.3 Project Scheduling<br>• Concept of Project Scheduling<br>• Factors that delay Project Schedule<br>• Principles of Project Scheduling<br>• Project Scheduling Techniques- Concept of Gantt Chart, PERT, CPM<br>5.4 Concept of Task Network<br>5.5 Ways of Project Tracking<br>5.6 Risk Management<br>• What is Software Risk?<br>• Concept of Proactive and Reactive risk strategies<br>• Types of Software Risks<br>5.7 Risk Assessment<br>• Risk Identification<br>• Risk Analysis<br>• Risk Prioritization<br>5.8 Risk control- Need, RMMM strategy<br>5.9 Software Configuration Management (SCM)<br>• Need of SCM<br>• Benefits of SCM<br>• SCM Repository-Functions and Features supported<br>• SCM Process- Change control and version Control | 08 | 18 |
| 06 | **Software Quality Management**<br>**Objectives:-**<br>➢ To develop quality awareness for software products.<br>➢ To become familiar with the available Quality Standards.<br>6.1 Basic Quality Concepts<br>6.2 Software Quality Assurance (SQA)<br>• Definition of SQA<br>• SQA Activities<br>6.3 Concept of Statistical SQA<br>6.4 Quality Evaluation Standards<br>• Six sigma for software - Concept of DMAIC and DMDAV Approach<br>• ISO 9000 for software - concept and major considerations<br>6.5 CMMI- CMMI Levels, Process Areas considered.<br>6.6 CMMI Vs ISO.<br>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 |

**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:**

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:

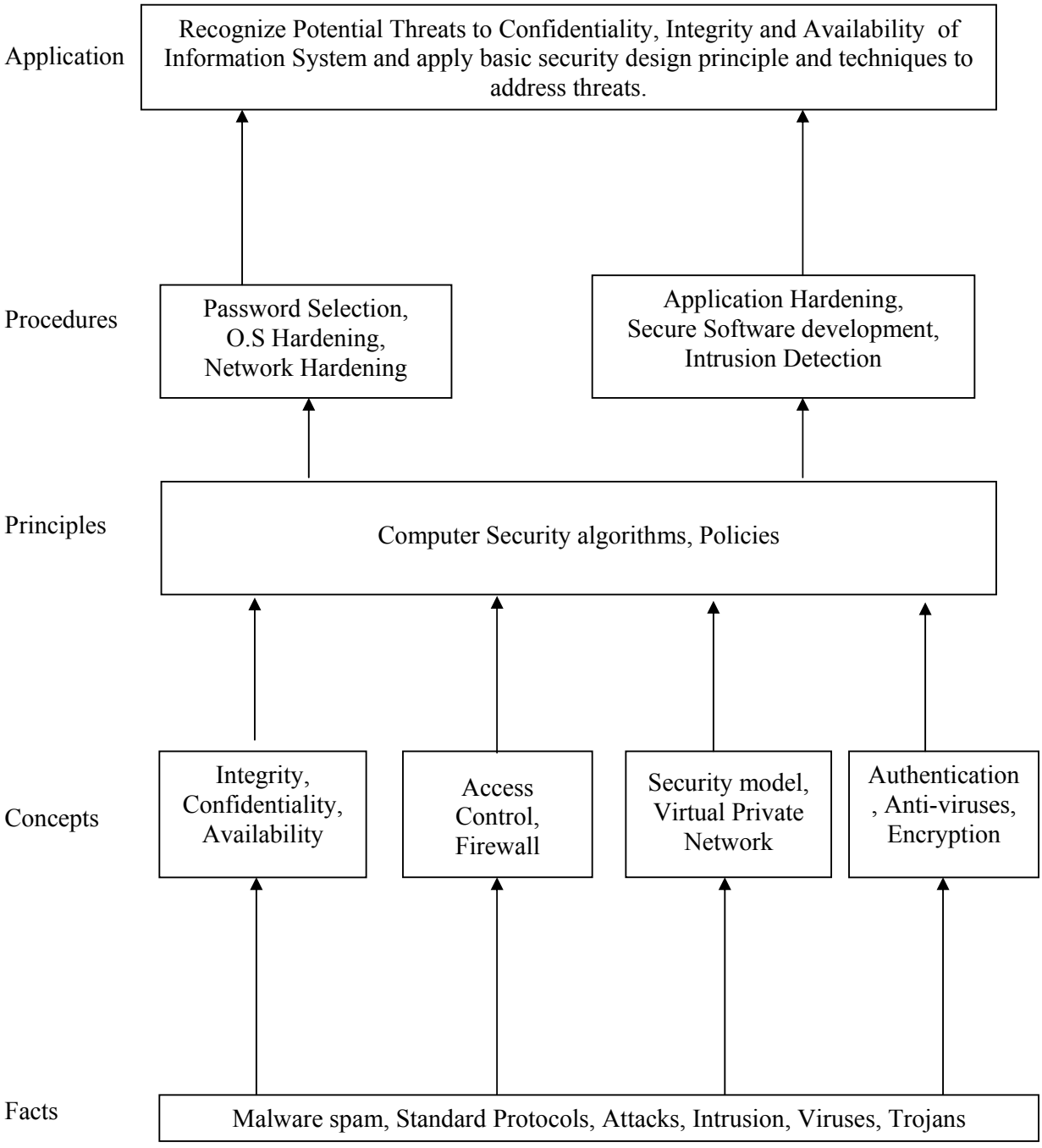
**Intellectual Skills**:

- 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:**



**Theory:**

| Topic No | Contents | Hours | Marks |
|---|---|---|---|
| 1 | **Introduction to computer security and security trends.**<br>**Objectives:**<br>➢ To understand CIA model.<br>➢ To identify the risks and threats.<br>➢ To understand security attacks.<br>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.<br>1.2 Risk and Threat Analysis: Assets, Vulnerability, Threats, Risks, Counter measures.<br>1.3 Threat to Security: Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, steps in attack<br>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.<br>1.5 Malware : Viruses, Logic bombs | 10 | 22 |
| 2 | **Identification, Authentication and Operational Security**<br>**Objectives:**<br>➢ To understand role of people in security<br>➢ To study access control methods<br>➢ To understand biometrics and network security.<br>2.1 User name and password, Managing passwords, choosing password.<br>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<br>2.3 Access controls: Definition, principle, policies: DAC, MAC, RBAC.<br>2.4 Biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes. | 10 | 20 |
| 3 | **Cryptography**<br>**Objectives:**<br>➢ To understand cryptography.<br>➢ To understand transposition techniques<br>➢ To understand symmetric and asymmetric cryptography<br>3.1 Introduction : Cryptography, Cryptanalysis, Cryptology, Substitution techniques: Caesar's cipher, monoalphabetic and polyalphabetic, one-time pad.<br>3.2 Transposition techniques – Rail fence technique, simple columnar, Steganography.<br>3.3 Hashing – concept<br>3.4 Symmetric and asymmetric cryptography: Introduction to Symmetric encryption, DES ( Data encryption Standard ) algorithm, Asymmetric key cryptography : Digital Signature. | 08 | 16 |

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| 4 | **Computer Security Technology and Intrusion Detection**<br>**Objectives:**<br>➢ To understand Firewall technique<br>➢ To understand VPN, Kerberos, security topologies<br>➢ To understand intrusion detection system<br>➢ To understand email security, IP security<br>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.<br>4.2 Virtual Private Network work, Kerberos – concept, security topologies: security zones, DMZ, Internet, Intranet, VLAN.<br>4.3 Intrusion Detection: Intrusion detection systems (IDS), host based IDS, network based IDS, Honey pots.<br>4.4 Email security: Email security standards: Working principle of SMTP, PEM, PGP, S/MIME.<br>4.5 IP security: overview, architecture, IPSec Configuration, IPSec Security. | 12 | 24 |
| 5 | **IT Act and Cyber law**<br>Objectives:<br>➢ Learn about different cyber crimes<br>➢ Understand IT acts in India<br>5.1 Introduction to Deleted File Recovery Formatted Partition Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics.<br>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<br>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**<br>**Objectives:**<br>➢ To understand application hardening and patches.<br>➢ To understand web security.<br>6.1 Application hardening, application patches, web servers, active directory.<br>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 |
| | **Total** | **32** |

**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
4. 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:**

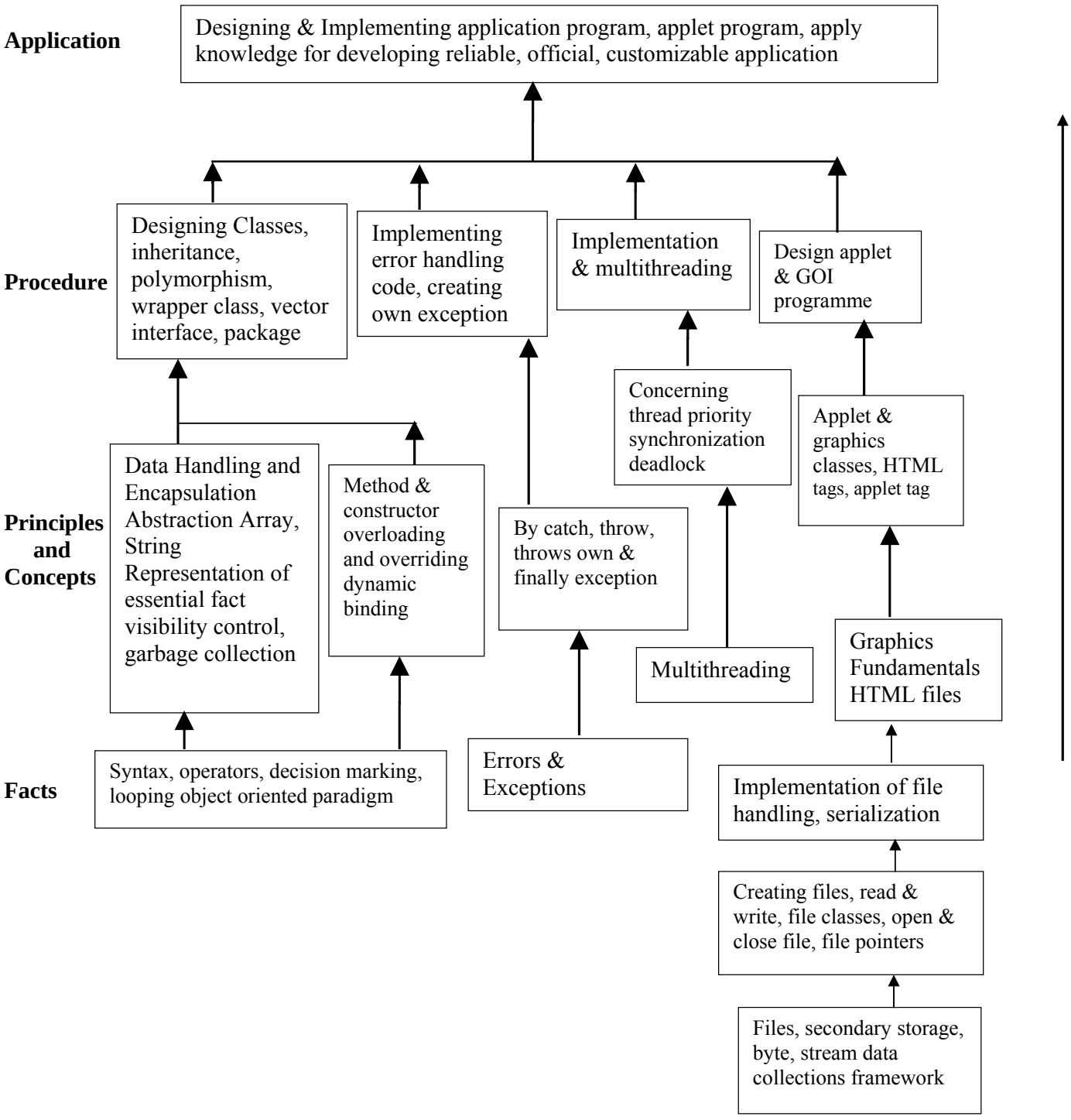
Nowadays, object oriented paradigm is of utmost importance for programming. Java language supports and is a very good means of understanding and implementing the OOP concepts. Java language enables the easy development of robust, secure, reusable and portable application. An application may be a standalone 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:**



**Contents:**

| Chapter | Content | Hours | Marks |
|---|---|---|---|
| 01 | **Introduction to Java**<br>Specific Objectives:<br>➢ To understand the features, Data types, Decision making and looping, constructs of java language.<br>1.1 Java Features and the Java Programming Environment.<br>Object Oriented, Compiled, Interpreted, Platform independent, Portable, Robust and Secure, Dynamic.<br>1.2 Java Tokens & Data types<br>Constants & Symbolic Constants, variables, dynamic initialization, data types, array & string, scope of variable, type casting, standard default values.<br>1.3 Operators & Expressions<br>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().<br>1.4 Decision making & looping<br>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**<br>Specific Objectives:<br>➢ To create classes, objects and make use of arrays and strings.<br>➢ They will also learn the concepts of inheritance and garbage collection.<br>2.1 Defining a class, creating object,<br>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.<br>2.2 Visibility Control Public, Private, Protected, default, friendly private Protected access.<br>2.3 More on Arrays & Strings<br>Types of arrays, creating an array, strings, string classes & string buffer, vectors, wrapper, classes, enumerated types.<br>2.4 Inheritance<br>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**<br>Specific Objectives:<br>➢ To create and use interface and packages.<br>➢ They will also learn the package naming, conventions and about the static import.<br>3.1 Interface<br>Define Interface, implementing interface , accessing interface, variables& methods, extending interfaces, interface references, nested interfaces<br>3.2 Package<br>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**<br>Specific Objectives:<br>➢ To handle the exceptions in programs effectively.<br>➢ They will also learn 'how to make their programs multithreaded', set thread priorities, and the concept of deadlock.<br>4.1 Errors & Exception<br>Types of errors, exceptions, try & catch statement, nested try statement, throws & Finally statement, build-in exceptions, chained exceptions, creating own exception, subclasses.<br>4.2 Multithreaded Programming<br>Creating a Thread: By extending to thread class & by implementing runnable Interface.<br>Life cycle of thread: Thread Methods:<br>wait(), sleep(), notify(), resume(), suspend(), stop().<br>Thread exceptions, thread priority & methods, synchronization, inter-thread communication, deadlock. | 08 | 16 |
| 05 | **Java Applets & Graphics Programming**<br>Specific Objectives:<br>➢ The students will be able to write interactive applets and make use of graphics in programming.<br>➢ They will also learn to change the background and the foreground color and to use the different fonts.<br>5.1 Introduction to applets<br>Applet, Applet life cycle (skeleton), Applet tag, Adding Applet<br>To HTML file, passing parameter to applet, embedding <applet>tags in java code, adding controls to applets.<br>5.2 Graphics Programming<br>Graphics classes, lines, rectangles, ellipse, circle, arcs, polygons, color & fonts, setColor(), getColor(), setForeGround(), setBackGround(), font class, variable defined by font class: name,<br>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**<br>Specific Objectives:<br>➢ The students will be able to work with File IO and collections frame work.<br>➢ They will also learn the concept of serialization**.**<br>6.1 File classes<br>Stream classes, byte stream (FileInputStream&FileOutputStream), character stream (FileReader&FileWriter) serialization.<br>6.2 Introduction to collections frame work<br>Array list, date class, set class, Iterator, map class. | 04 | 12 |
| | **Total** | **48** | **100** |

**List of Practical:**

1. Understand the java programming environment to learn the different available tools
2. Develop a program to display all the even numbers between 1 to 20 using for loop & if statement
3. Develop a program to create a class Student with data membersstudent_name, roll_no& branch. Initialize and display values of data members.
4. Develop a program to convert a string from lowercase to uppercase using method of String class.

**Practice Exercise/ Experiments**

5. Develop a program that creates a vector toinsert and display five elements of different data types.
6. Develop a program to create a class "Chocholate" having data members 'ChocoName'& 'ChochoQuantity'.Derive a class "ChochoFlavor" having data member 'FlavorName'. Initialize the values for two objects of 'ChochoFlavor' class using constructor and display it.
7. Define a package named ''myPackage''to include a class named 'DisplayMsg' with one method to display some message. Develop a program to import this package in a java application and call the method defined in the package.
8. Develop a program to throw a user defined exception if the given number is not positive.

**Practice Exercise/ Experiments**

9. Develop a program to create two threads such that one threads displays the message "How do you do?" and the other thread displays the message "Fine, Thank you!"
10. Develop a program to create an applet to display the message "Welcome to the world of Applet".
11. Develop a program to copy the contents of the file "abc.txt" into a new file "xyz.txt".
12. Design & Develop a mini project. (With optional activity at the end)

**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 : 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.

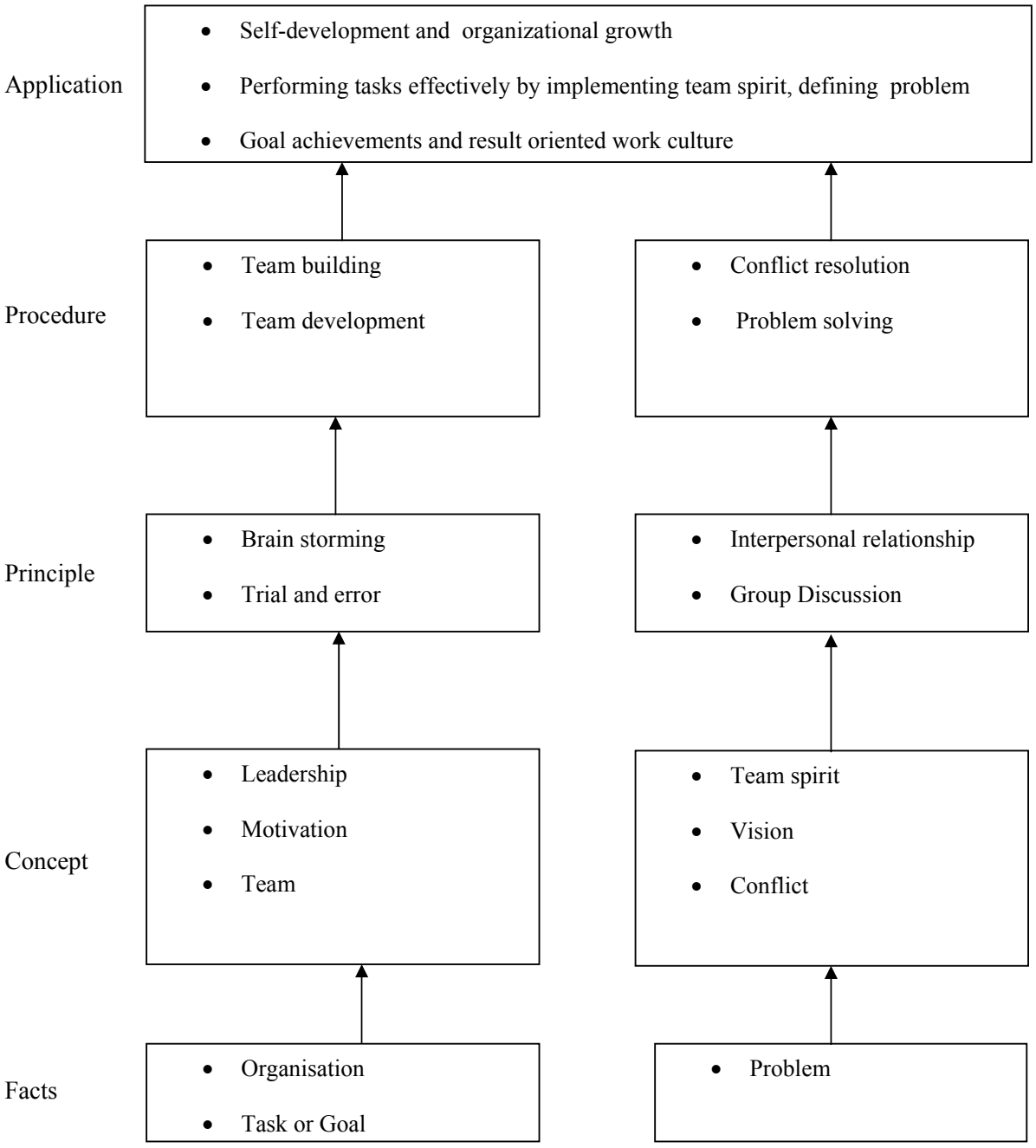
This subject of 'Behavioural Science' provides a broad base in which a technician can develop a successful career in the world of work.

**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:**



**Theory:**

| Topic and Contents | Hours |
|---|---|
| **Topic 1: Leadership**<br>1.1 Management Education-History, Development, Importance, Areas of specialization, need and importance of behavioural science<br>1.2 Meaning and Types of Leaders, Qualities of leader, Examples<br>1.3 Leadership- Definition, importance, leadership in various organizations<br>1.4 Leadership styles-task -people matrix. Persuasive, Authoritative, Democratic, Delegative Leadership styles. Maturity of followers, situational leadership | 02 |
| **Topic 2: Motivation**<br>2.1 Meaning<br>2.2 Importance of Motivation<br>2.3 Types of Motivation- Intrinsic, Extrinsic, Examples<br>2.4 Maslow's motivation theory- pyramid of needs, individual and industrial applications<br>2.5 Tips for Motivation | 02 |
| **Topic 3: Emotional Intelligence**<br>3.1 Major concepts - emotion, families of emotion, components of emotional expressions<br>3.2 Emotional intelligence, cognitive intelligence<br>3.3 Basic emotional competencies | 02 |
| **Topic 4: Team Building**<br>4.1 Team- Need, Definition, Difference between group and team<br>4.2 Characteristics of a good team<br>4.3 Steps in team formation- forming, norming, storming, performing, adjourning<br>4.4 Roles of team members<br>4.5 Characteristics of a good team member<br>4.6 Types of teams-Work, mgmt, cross functional, quality circle, self-managed team | 03 |
| **Topic 5: Conflict Resolution**<br>5.1 Definition, types (interpersonal, intrapersonal, groups), indicators of conflicts<br>5.2 Sources of conflict - ego, poorly defined authority and responsibility, power, interests, greed, difference in value system, complex work situations<br>5.3 Skills for conflict resolution<br>5.4 Steps in conflict management -Mapping of conflict, negotiation- steps in negotiation,<br>5.5 Styles of conflict management- collaborating, competing, cooperating, avoiding, compromising | 03 |
| **Topic 6: Decision Making**<br>6.1 Importance of decision making<br>6.2 Definition Characteristics of good decision<br>6.3 Characteristics of good decision | 02 |

| | |
|---|---|
| 6.4 Types of decisions- programmed, non programmed, strategic, tactical, impulsive<br>6.5 Group decision making<br>6.6 Steps of decision making | |
| **Topic 7: Interview Techniques**<br>7.1 Job search opportunities<br>7.2 Development of résumé´ and cover letter- essentials of a good résumé´, contents of Résumé´, layout of résumé´, cover letter<br>7.3 Group discussion- objectives, do's and don'ts for effective participation, evaluation parameters, suggested topics<br>7.4 Psychometric tests- Aptitude test, guidelines for preparations for aptitude test, Personality test<br>7.5 Personal interview-guidelines for preparing for job interviews, common questions | **02** |
| **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 Assignments:**

| | |
|---|---|
| 01 | Case study: Employee motivation and leadership. |
| 02 | To build a tower from a given material as a team activity |
| 03 | To prepare Jigsaw puzzles (common shapes) from the given jigsaw pieces as a team. |
| 04 | Case study on conflict Resolution |
| 05 | Assess your style of conflict resolution |
| 06 | Decision making activity: of Selection of the best suitable company. |
| 07 | Participate in a guided group discussion |
| 08 | Assessment of self-aptitude in numerical computation, estimation, data interpretation, mechanical, spatial and abstract reasoning |
| 09 | Assessment of self-aptitude in Verbal ability and data checking. |
| 10 | Development of résumé´ and covering letter |

**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**

**Semester : Fifth for CO and Sixth for CD**

**Subject Title : Windows Programming Using VC++**

**Subject Code : 17076**

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Examination Scheme | | | | | |
|---|---|---|---|---|---|---|---|---|
| TH | TU | PR | PAPER HRS | TH | PR | OR | TW | TOTAL |
| 01 | -- | 02 | -- | -- | 25# | -- | 25@ | 100 |

**Rationale:**

Today's software developers are constantly adopting new technologies as target devices like PCs, Laptops, Mobile Phones, etc. support Internet and Windows based applications. Windows Operating System and its variants provides rich GUI environment for developing easy to use and consistent user interface. As most of the software developers mostly trust Visual C++ programming environment for its power, usage, rich of facilities and efficiency. Also, with regards to JAVA Windows development environment, Microsoft VC++.Net with its all versions have been widely used as the Windows Programming Tool.

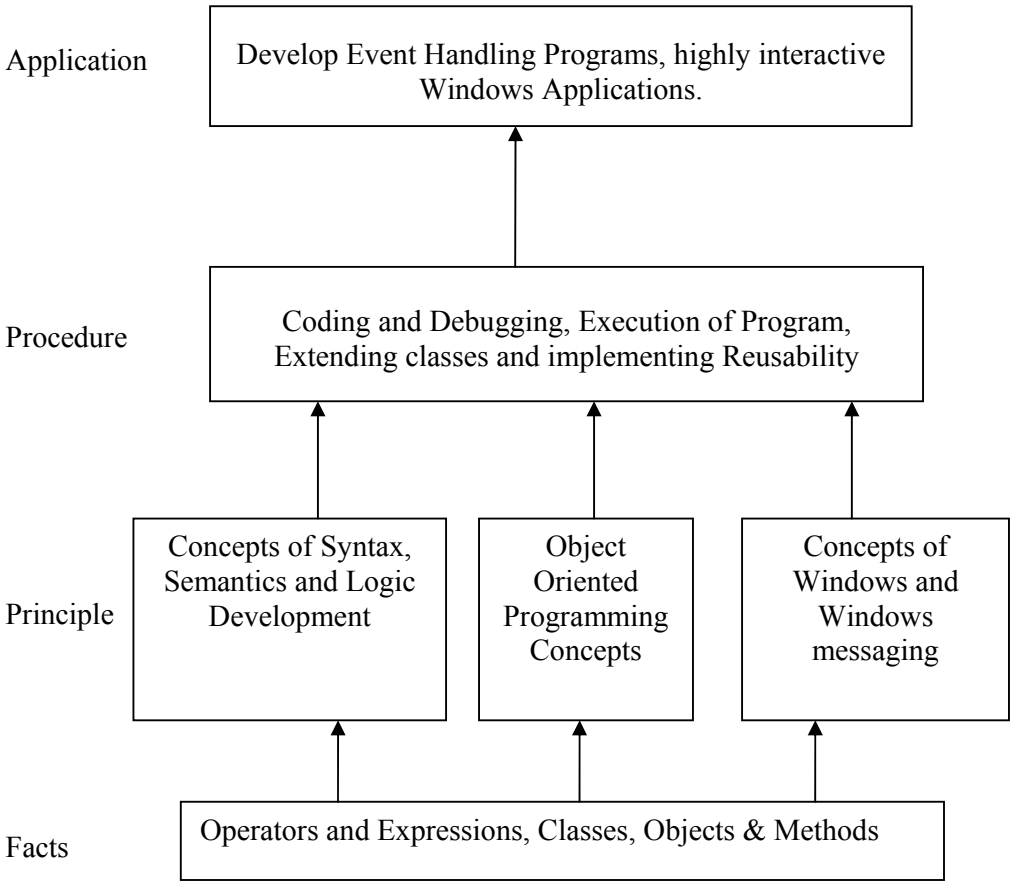
The Course is designed such that, Windows Programming Skills using VC++ as a tool will be enhanced. It addresses the issues in Windows Programming related to Basic Windows, its structure and operation, various utilities, built-in functions and methods, MFC utilities, etc. Students will be able to operate, use, create and build Windows based applications after completing the course.

**Objectives:**

Students will be able to

1. Study the GUI basics and Windows Programming basics.
2. Operate Windows Development Environment using VC++.Net Tool.
3. Create Write, Test, Compile and Implement Windows Programs.
4. Use MFC utilities for Keyboard interface, mouse interface, printer interface, etc.
5. Create and use checkboxes, Radio-Button, List Boxes, Scrollbars, etc.
6. Create and use Menus, Tool-Bars etc.
7. Create and handle Dialog Boxes and add various controls.

**Learning Structure:**



**Contents:**

| Sr. No | Name of Topics / Subtopics | Hours |
|---|---|---|
| 1 | **Overview of MS-Windows**<br>**Objectives:**<br>➢ **Learn Visual C++ Environment**<br>➢ **Understand Unicode concept**<br>1.1 The Windows Environment, Windows Programming Options, Your First Windows Program,<br>1.2 A brief History of Character Sets, Wide Characters And C, Wide Characters And Windows<br>1.3 MFC Class and Application framework<br>1.4 Application class and windows class | 02 |
| 2 | **Windows and Messages**<br>**Objectives :**<br>➢ **Know Registering the window class**<br>➢ **Write simple program using VC++ environment**<br>➢ **Create , Compile and Implement Windows Program**<br>2.1 An Architectural Overview, Registering the Window class, Creating Window, Displaying the Window, The Message Loop, The Window Procedure, Processing the messages<br>2.2 The WM_PAINT message, The WM_DESTROY message, Queued and Non-queued messages<br>2.3 Painting and Repainting ,An Introduction to GDI , The Device Context, Getting a Device Context Handle, The Paint Information Structure, Scroll Bar, Building a Better Scroll<br>2.4 Pens, brushes, font etc. | 03 |
| 3 | **GDI and Basic Drawing**<br>**Objectives :**<br>➢ **Know GDI Structure**<br>➢ **Understand GDI primitives**<br>➢ **Write program to draw Dots and Lines**<br>3.1 The Structure of GDI : The GDI philosophy, The GDI function calls, The GDI primitives<br>3.2 The Device Context : Getting the Device Context Handle, Getting Device Context information<br>3.3 Drawing Dots and Lines : Setting Pixels, The Bounding Box functions, Drawing Filled Areas | 04 |
| 4 | **The Keyboard**<br>**Objectives :**<br>➢ **Understand keyboard events**<br>➢ **Know virtual key codes**<br>➢ **Understand Character Messages**<br>4.1 Keyboard Basics, Keystroke Messages, System and Nonsystem Keystrokes, Virtual Key codes, Using Keystroke Messages<br>4.2 Character Messages : The Four Character Messages , Message Ordering, Control Character Processing ,Dead Character Messages<br>4.3 Keyboard Messages and Character Sets : The Keyview1 Program, The foreign Language Keyboard Problem, Character Sets and Fonts<br>4.4 Handling Keyboard Messages | 04 |

| Sr. No | Name of Topics / Subtopics | Hours |
|---|---|---|
| 5 | **The Mouse**<br>**Objectives:**<br>➢ **Know Mouse basics**<br>➢ **Know Client area & Non Client Area Mouse Messages**<br>5.1 Mouse Basics, Client Area Mouse Messages, Simple Mouse Processing<br>5.2 Non-Client Area Mouse Messages: The Hit-test Message, Message Beget Messages<br>5.3 Emulating the Mouse with the Keyboard ,Using child windows for Hit Testing , Child Windows and the Keyboard<br>5.4 Capturing the Mouse: Blocking out a Rectangle, The capture Solution, The BLOKOUT2 program.<br>5.5 Handling Mouse Messages | 03 |
| | **Total** | **16** |

**List of Practical:**

1. Demonstrate the Visual C++ environment, installation of the software and getting familiar with various elements of VC++ IDE
2. Understand parts of VC++ program and know the steps for writing, compiling and executing VC++ program
3. Write a program to draw dots and lines using GDI in VC++.
4. Write a program to draw dots and lines using GDI in VC++.
5. Write a program to draw filled areas and rectangles using GDI in VC++.
6. Demonstrate how to read keystrokes from the keyboard in VC++.
7. Write a program to display text at a desired window using VC++.
8. Write a program to find size of a window in VC++.
9. Write a program for resizing of a window in VC++.
10. Write a program for handling mouse events such as click and double click.

**Learning Resources:**

**Books:**

| Sr. No. | Author | Title | Publisher |
|---|---|---|---|
| 1 | Charles Petzold | Programming Windows | Wiley Publications |
| 2 | Steven Holzner | Microsoft Visual C++ 5 | TMH |
| 3 | Brent E. Rector<br>JosephM. Newcomer | Win32 Programming | Addison Wesley |

**Web Sites:**

http://www.functionx.com/win32/index.htm
http://www.onesmartclick.com/programming/visual-cpp.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 : 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:**

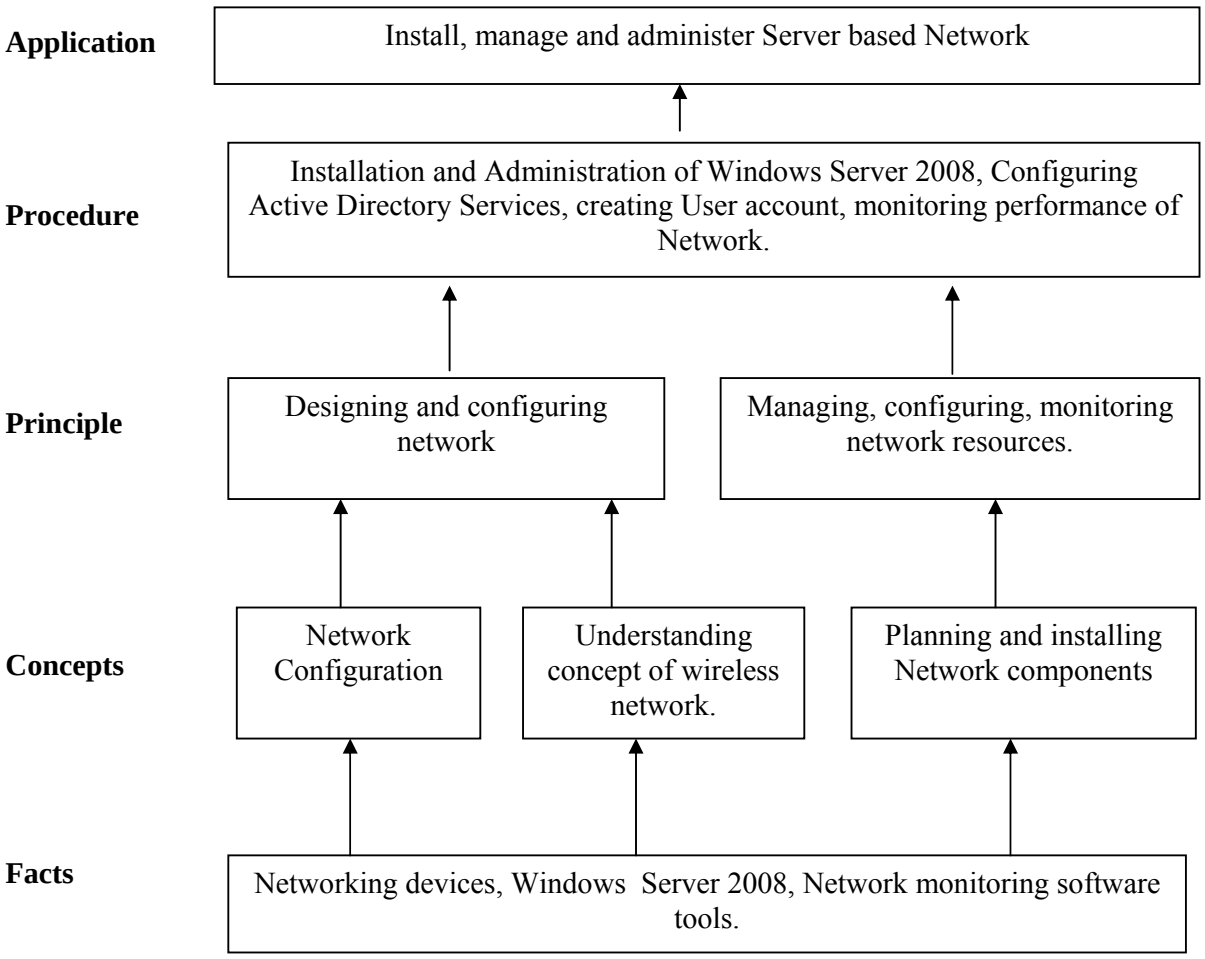
Students will be able to

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:**



**Contents:**

| Chapter | Name of the Topic | Hours |
|---|---|---|
| 01 | **Concepts Of Networking**<br>**Objectives:-**<br>➢ To understand basic hardware & software requirement for building a network.<br>**1.1** Network configuration- Peer-to-Peer Network, Server based Network<br>• Network Topologies & Types.<br>• Basic Network Media.<br>**1.2** Planning & Installing Network Hardware<br>• Types of Server- File, Print, Mail, Web & Database Servers.<br>• Installing a NIC, Twisted Pair Cable, fiber optic Cable, Switches etc. | 02 |
| 02 | **Windows Server 2008**<br>**Objectives:-**<br>➢ To understand Network operating System & Concept of Active Directory Services.<br>**2.1** Installing & Configuring Windows Server<br>• Checking System Requirements.<br>• Choosing a File System.<br>• Planning Partitions.<br>• Deciding TCP/IP Configuration.<br>• Choosing Workgroups or domains.<br>**2.2** Dealing with Directory Services<br>• Define directory services, (NDS), Windows NT Domains, Microsoft Active Directory Service (ADS), X.500 Directory Access Protocol (DAP), and LDAP.<br>• Understanding ADS Structure, Objects, Domains, Organizational Units (OU), Trees, Forests. | 04 |
| 03 | **Managing User Accounts & Resource Services**<br>**Objectives:-**<br>➢ Managing user accounts, shared folders and network printers.<br>**3.1** Understanding user accounts<br>• Creating a new user.<br>• Setting user properties.<br>• Deleting or disabling user accounts.<br>• Working with groups:- Group types, Group Scope, Creating a Group & adding member to a Group.<br>• Understanding Group Policies.<br>**3.2** Managing Resource Services<br>**3.2.1** Managing File Server:<br>• Understanding permissions, sharing files & folders, configuring File Server.<br>**3.2.2** Managing Print server:<br>• Network Printing Process.<br>• Managing Shared Printer.<br>• Adjustment Print Server settings. | 04 |

| | | |
|---|---|---|
| 04 | **Configuring Dhcp And Dns**<br>**Objectives:-**<br>➢ To understand configuration of DHCP and DNS.<br>**4.1** DHCP (Dynamic Host Configuration Protocol)<br>• Understanding DHCP- IP Address Assignment, DHCP Architecture.<br>• Working with DHCP Server – Installing, configuring and managing DHCP Server.<br>**4.2** DNS (Domain Name System) –<br>• Understanding DNS Names- Domain, domain-naming, top level domains, sub-domains, Name Resolution.<br>• Managing DNS server and DNS Clients | 03 |
| 05 | **Network Administration And Security**<br>**Objectives:-**<br>➢ To understand network administration and maintaining security.<br>5.1 Role of Network Administrator.<br>5.2 Use of Software tools for monitoring & administration of Network.<br>5.3 Securing user accounts.<br>5.4 Securing the Network using Firewall, Disabling unnecessary Services.<br>5.5 Role of SNMP in Network Management.<br>5.6 Working with Windows-2008 backup software. | 03 |
| | **Total** | **16** |

**List of Practicals:**

| Sr No. | Name of Practical |
|---|---|
| 1 | Understand the networking in the laboratory and determination of various networking hardware and software components with their technical specification. |
| 2 | Install and Configure Network Interface card and configure TCP/IP in the laboratory. |
| 3 | Install Windows server 2008 |
| 4 | Set up Domain Name System (DNS) Server and Install Active Directory Server on windows server 2008. |
| 5 | Creating and Managing user accounts in windows server 2008 |
| 6 | Create folders and manage folders in windows server 2008 |
| 7 | Configure and manage Print Services |
| 8 | Install and configure DHCP Server |
| 9 | Tuning and monitoring network system |
| 10 | Working with Windows Server 2008 Back up utilities and services. |
| 11 | Study of wireless network |
| 12 | Study of Cloud Computing as Network Infrastructure Component |

**Learning Resources:**

1. **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 |

2. **Web References:**
   1. www.snmp.com
   2. www.triti.com
   3. www.cisco.com

**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 : 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.

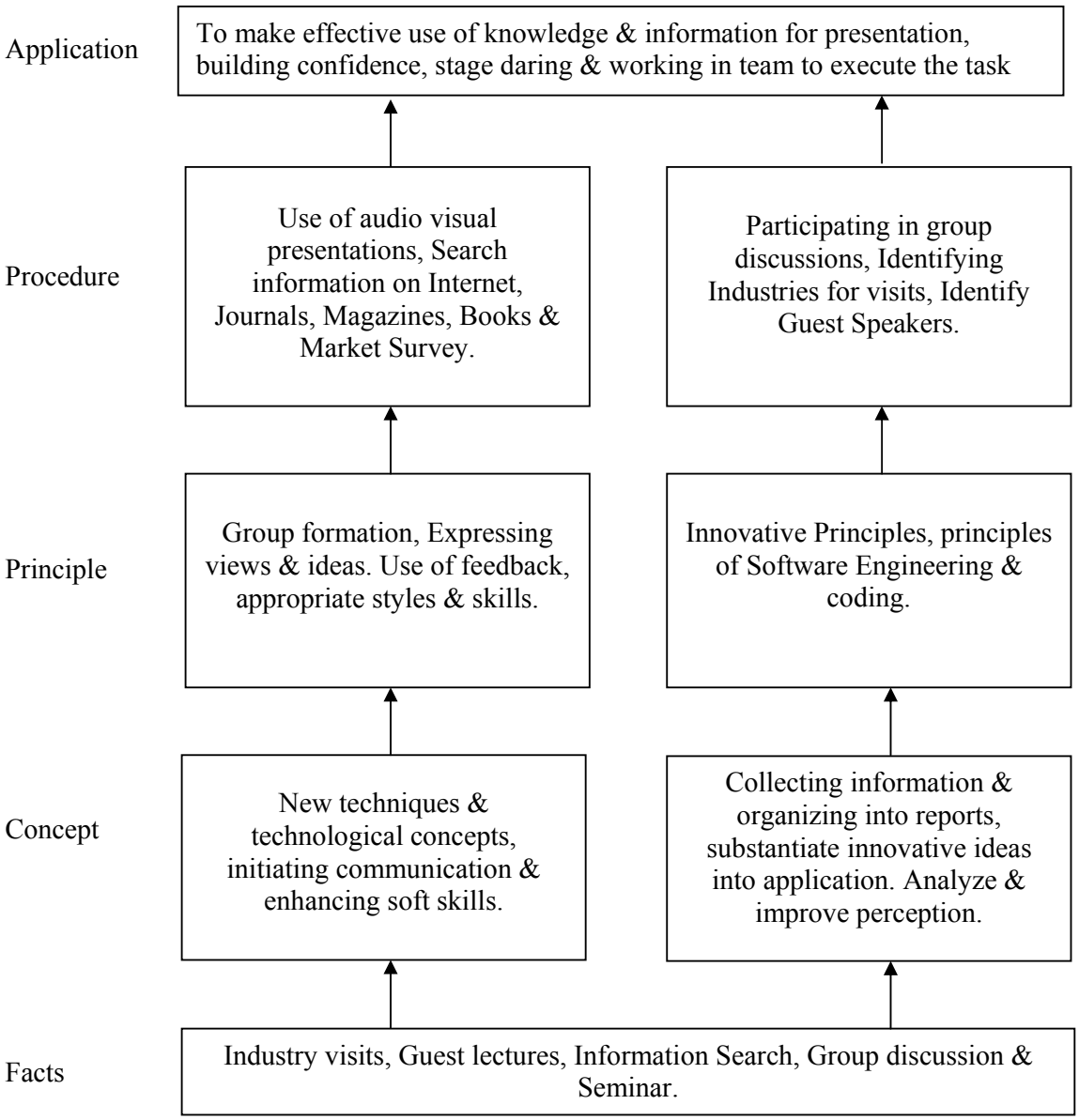
**Objectives:**

**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:**



**Contents:**

| Activity | Name of Activity |
|---|---|
| 01 | **Industry Visit : (At least One)**<br>Industry visit should be arranged and each student should submit the technical report individually as a part of term work.<br>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)**<br>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.<br>• 3 – D animation techniques.<br>• Stress management.<br>• IT Act 2008.<br>• Linux installation & administration.<br>• Resume writing & preparation of C.V.<br>• Introduction of "Python" programming language.<br>• Career opportunities in IT industry.<br>• Plastic Memory<br>• Psychological Personality Development.<br>• Managing emotional quotient<br>• Internet Marketing. |
| 03 | **Information Search: (Any Two)**<br>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.<br>Prepare Individual technical report on selected topics of 8-10 pages & deliver seminar on at least one topic.<br>• Android O.S. of mobile systems.<br>• Autonomic computing to manage complexity of network components.<br>• Cloud computing – application (any one).<br>• Biometrics – in secure E-transactions.<br>• Pervasive Computing<br>• E – MINE: A novel web mining approach<br>• 4 G wireless systems<br>• Jini – advanced set of network protocols<br>• Parasitic Computing<br>• E – wallet<br>• Nano – technology and applications<br>• DNA computing<br>• Artificial neural networks & their applications. |
| 04 | **Group Discussion : (Any One)**<br>Form a group of 5 students and write a brief report on selected topic as a part of term work.<br>Some of the suggested topics:-<br>• Role of UN in peace keeping<br>• Effect of cinema on youth<br>• Government contribution to IT<br>• Balance between professionalism & family |

| | |
|---|---|
| | • Position of women India compare to other nations<br>• Present state of Indian Cricket Team<br>• Is globalization really necessary?<br>• Is India growing spiritually?<br>• Any other suitable topic. |
| 05 | **Prepare Yourself : (Any Two)**<br>Preparation towards Interview. Write a brief report on selected topic as a part of term work.<br>• Mock Interview<br>• Mock aptitude test & puzzle solving.(Attach answer paper)<br>• CV Preparation. (Attach CV). |
| 06 | **Seminar:**<br>Form a group of 4 students<br>Seminar should be on Final year Industrial Project synopsis & week wise plan for completion of project.<br>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

**OR**

**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.
- Students shall submit a brief report on topic No. 5 of Professional Practices-III
- Student shall give seminar on industry training as activity No. 6.
- These students shall submit report of Industrial training signed and certified by authorities from Industry.
- Evaluation will be done on seminar and report submitted by student.

**Note:**

For the students who have undergone industrial training of four weeks duration in the summer vacation of fourth semester will be assessed as follows:

1. Industrial Training report duly certified by competent authority in the industry: **30 Marks**
2. Brief report on topic no. 5 **05 Marks**
3. Seminar on industrial training: **15 Marks**