**TILAK MAHARASHTRA VIDYAPEETH,PUNE**

**TEACHING AND EXAMINATION SCHEME FOR DIPLOMA COURSE**

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**DURATION OF COURSE : 6 SEMESTERS**

**SEMESTER : FIFTH SEMESTER** **DURATION : 16WEEKS**

**FULL TIME**

| SR. NO | SUBJECT TITLE | SUBJECT CODE | TEACHING SCHEME | | EXAMINATION SCHEME | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | TH | PR | PAPER HRS | TH | | INT | TOTAL | | PR | | OR | | TW | |
| | | | | | | Max | Min | | Max | Min | Max | Min | Max | Min | Max | Min |
| 1 | Software Engineering | CO5001 | 04 | -- | 3 | 80 | 32 | 20 | 100 | 40 | -- | -- | -- | -- | 25* | 10 |
| 2 | Java Programming | CO5002 | 04 | 04 | 3 | 80 | 32 | 20 | 100 | 40 | 50** | 20 | -- | -- | 25* | 10 |
| 3 | System Security | CO5003 | 04 | -- | 3 | 80 | 32 | 20 | 100 | 40 | -- | -- | -- | -- | 25* | 10 |
| 4 | Operating System | CO5004 | 04 | 02 | 3 | 80 | 32 | 20 | 100 | 40 | -- | -- | 25** | 10 | 25* | 10 |
| 5 | Network Management & Administration | CO5005 | 02 | 02 | -- | -- | -- | -- | -- | -- | -- | -- | 25** | 10 | 25* | 10 |
| 6 | **Elective I (Any one)** | | | | | | | | | | | | | | | |
| | Database Management | CO5006 | 04 | 04 | 3 | 80 | 32 | 20 | 100 | 40 | -- | -- | 25** | 10 | 25* | 10 |
| | Windows Programming | CO5007 | 04 | 04 | 3 | 80 | 32 | 20 | 100 | 40 | -- | -- | 25** | 10 | 25* | 10 |
| 7 | Professional Practices-IV | CO5008 | -- | 02*** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 50* | 20 |
| 8 | Development of Generic Skills-II | CO5011 | 01 | -- | 2 | 40 | 16 | 10 | 50 | 20 | -- | -- | -- | -- | -- | -- |
| **TOTAL** | | | **23** | **14** | **--** | **440** | **--** | **110** | **550** | **--** | **50** | **--** | **75** | **--** | **200** | **--** |

STUDENT CONTACT HOURS PER WEEK : **37 HRS : Theory and Practical Periods are of 60 minutes each**

* - INTERNAL ASSESSMENT , ** - EXTERNAL ASSESSMENT , ***-TUTORIAL

**TOTAL MARKS – 875**

ABBREVIATIONS : TH – THEORY , INT- INTERNAL, PR – PRACTICALS , OR –ORAL, TW – TERMWORK

**All Practical, Orals and Term Work assessments are to be done as per the prevailing norms for implementation and assessment**

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : SOFTWARE ENGINEERING**

**SUBJECT CODE : CO5001**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **PR** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 04 | -- | 03 | 80 | 20 | -- | -- | 25* | 125 |

**Pre-requisite:** The Student must know the following concept:

1. Basic concepts of Database.

**Objectives:** The Student will be able to

1. Plan & develop framework of projects.
2. Compare various project process models & use in project planning.
3. Use the principles of communications, planning, modeling construction & deployment.
4. Apply testing strategies & methods on software projects.
5. Identify the duties & responsibilities of people, team leader & stakeholders while planning the software project.
6. Schedule the project according to time, size, shape, utility & application.
7. Monitor & manage the risk during the design of software project.
8. Use the parameters of software quality assurance.
9. Prepare the estimation of software.

| Subject Title: SOFTWARE ENGINEERING | Subject Code: CO5001 |
|---|---|

**Content: Theory**

| Unit | Name of the Topics | Hours | Marks |
|---|---|---|---|
| 01 | **OVERVIEW OF SOFTWARE ENGINEERING & SOFTWARE DEVELOPMENT PROCESS**<br>The evolving role of software & changing nature of software, Software Engineering - A layered technology approach, A process framework & software project tracking & control, The Capability Maturity Model Integration technique, Process patterns, process Assessment, personal & Team, Process models & Process Technology Theories, Process Models (Waterfall, Incremental, RAD, Prototype, and Spiral), Persons involved in software development process. | 08 | 15 |
| 02 | **SOFTWARE ENGINEERING REQUIREMENTS AND DEVELOPMENT OF ANALYSIS & DESIGN MODELS**<br>Phases in software development, Software Engineering core principles, Communication Planning, Modeling, Construction & deployment principles, Requirements Engineering Tasks, Initiating the requirement process, Analysis approaches of software & preparation of analysis model using data modeling, Concepts, Object oriented analysis, Flow oriented model, Class-Based model, Behavioral Model, Design approaches of software & preparation of design model using Design concepts, Design model, Pattern based design. | 16 | 20 |
| 03 | **TESTING STRATEGIES & METHODS**<br>Software testing fundamentals, Strategic approach to software testing. Test strategies for conventional software, unit testing, Integration testing, Regression testing, smoke testing, Validation testing using alpha & beta testing, system testing using recovery, security, stress & performance testing, Black Box & White Box testing, Debugging process strategies. | 08 | 15 |
| 04 | **SOFTWARE PROJECT MANAGEMENT**<br>The management spectrum - The people, The product, The process & The project, Project scheduling - Basic concepts, relationship between people & effort, effort distribution, defining a task for the software project, Defining a task network & scheduling of project, Risk Management - Reactive vs. Proactive risk strategies, software Risks, Risk Identification, Risk Projection & Risk refinement, monitoring & management, Change Management - SCM scenario, SCM repository & process, Formal method & clean room software development & management approach. | 10 | 15 |

| | | | |
|---|---|---|---|
| **05** | **SOFTWARE QUALITY MANAGEMENT & ESTIMATION**<br>Basic quality concepts, Software quality assurance, Statistical software quality assurance, Six sigma strategy, Software reliability the ISO 9000 quality standards McCall's quality factors, Observations on estimation, The project planning process, software scope & feasibility, Resources, Decomposition Techniques, COCOMO II model & the Make / Buy design. | **06** | **15** |
| | **TOTAL** | **48** | **80** |

**Recommended Books:**

| Sr. No | Title | Author | Publisher |
|---|---|---|---|
| 01 | Software Engineering -A Practitioner's Approach | Roger S. Pressman | Tata McGraw Hill Publication |
| 02 | Software Engineering - Principles and Practices | Waman S. Jawadekar | Tata McGraw Hill Publication |

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : JAVA PROGRAMMING**

**SUBJECT CODE : CO5002**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **PR** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 04 | 04 | 03 | 80 | 20 | 50** | -- | 25* | 175 |

**Pre-requisites:** The Student must know the following concepts:

1. C language.
2. Concept of C++.
3. DOS commands.

**Objectives:** The Student will be able to

1. Design and implement classes and methods.
2. Understand and implement basic programming constructs.
3. Apply object oriented features to real time entities.
4. Implement conversion between data types.
5. Understand and implement the concept of reusability and extensibility.
6. Create packages and interface.
7. Manage errors and exceptions.
8. Design and implement applet and graphics programming.

| Subject Title: JAVA PROGRAMMING | Subject Code: CO5002 |
|---|---|

**Content: Theory**

| Unit | Name of the Topic | Hours | Marks |
|---|---|---|---|
| 01 | **INTRODUCTION TO JAVA**<br>Fundamentals of Object Oriented Programming: Object and Classes, Data Abstraction and Encapsulation, Inheritance, Polymorphism, Dynamic Binding.<br>Java Features: Compiled and Interpreted, Platform Independent and Portable, Object oriented, Distributed, Multithreaded and Interactive, High Performance. Constant, Variables and Data Types: Constant, Data types Scope of Variable, Symbolic Constant, Type casting and Standard default values.<br>Operator and Expression: Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment And Decrement Operator, Conditional Operator, Bitwise operator, Special Operator.<br>Decision making and Branching: Decision making with if statement, Simple if statement, if else statement, The else-if ladder, The switch statement, The? : Operator.<br>Decision making and Looping: The While statement, The do statement, for statement, Jumps in Loops, Labeled Loops. | 10 | 20 |
| 02 | **CLASSES, OBJECT AND METHODS**<br>Defining a class, Creating object, Accessing class members, Constructor, Methods Overloading ,Static Member, Inheritance Extending a Class :Defining a subclass Constructor, Multilevel inheritance, Hierarchical inheritance, Overriding Methods, Final variable and Methods, Final Classes, Abstract Method and Classes.<br>Visibility Control: Public access, friend access, Protected access, Private access, Private Protected access.<br>Array, Strings and Vectors: Arrays, One Dimensional array, Creating an array, Two Dimensional array, Strings Vectors, Wrapper Classes. | 08 | 10 |
| 03 | **INTERFACES AND PACKAGES**<br>Interface-Multiple Inheritance: Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface variable.<br>Packages-Putting Classes Together: System Package, Using system Package, Naming Convention, Creating Package, Accessing a package, Using a package, adding a class to a package. | 06 | 12 |
| 04 | **MULTITHREADED PROGRAMMING AND EXCEPTION HANDLING**<br>Multi threading: Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread method, Thread exceptions, Thread priority, Synchronization, Implementing a 'Runnable' Interface.<br>Managing Errors and Exceptions: Types of errors, Exception, Multiple catch statement, using finally statement, Using Exception for Debugging. | 08 | 10 |

| | | | |
|---|---|---|---|
| **05** | **JAVA APPLETS AND GRAPHICS PROGRAMMING**<br>Applet Programming: Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet. Graphics Programming: The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts. | **10** | **20** |
| **06** | **STREAMS AND FILE I/O**<br>Stream Classes, Character Stream, Byte Stream, Serialization. | **06** | **08** |
| | **TOTAL** | **48** | **80** |

**Practical:**

**Skills to be developed:**

**Intellectual skills:**

1. Object oriented concepts must be known.
2. Use of programming language constructs in program implementation.
3. Apply logic to solve given problem.
4. Identify different types of errors as syntax, semantic, fatal, linker & logical.

**Motor skills:**

Handling of Computer in proper way.

**List of Practical:**

1. Write simple programs based on basic syntactical constructs of Java like:
    a. Operators and expressions.
    b. Looping statements.
    c. Decision making statements.
    d. Type casting.
2. Write a simple Java program to demonstrate use of command line arguments in Java.
3. Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object
4. Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object
5. Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.
6. Write a Java Program to demonstrate use of sub class
7. Write a Java Program to demonstrate use of nested class.
8. Write a Java Program to practice
    - Use of single Dimensional array.
    - Use of multidimensional array.
9. Write a Java Program to implement array of objects.
10. Write a Java program to practice
    - Using String class and its methods
    - Using String Buffer class and its methods

11. Write a Java Program to implement Vector class and its methods.
12. Write a Java Program to implement Wrapper classes and their methods.
13. Write a Java Program to implement single inheritance by applying various access controls to its data members and methods.
14. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
15. Write a Java Program to implement inheritance and demonstrate use of method overriding.
16. Write a program to demonstrate
    - Use of implementing interfaces.
    - Use of extending interfaces.
17. Write a Java program to implement the concept of importing classes from user defined package and creating packages.
18. Write a program to implement the concept of threading.
19. Write a program to implement the concept of Exception Handling
    - Using predefined exception.
    - By creating user defined exceptions.
20. Write a program to implement the concept of Synchronization for
    - Object synchronization.
    - Method synchronization.
21. Write a program using Applet
    - To display a message in the Applet.
    - For configuring Applets by passing parameters.
22. Write programs for using Graphics class
    - To display basic shapes and fill them.
    - draw different items using basic shapes
    - set background and foreground colors.
23. Write program to demonstrate use of I/O streams.
24. Write program to demonstrate use of File streams.

**Recommended Books:**

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

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : SYSTEM SECURITY**

**SUBJECT CODE : CO5003**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **PR** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 04 | 00 | 03 | 80 | 20 | -- | -- | 25* | 125 |

**Pre-requisites:** The Student must know the following concepts:

1. Computer fundamentals.
2. Knowledge of computer hardware and software.

**Objectives:** The 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 System.
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 those are more secure against attacks.
7. Apply security principles to secure Operating Systems and applications.

| Subject Title: SYSTEM SECURITY | Subject Code: CO5003 |
|---|---|

**Content: Theory**

| Unit | Name of the Topic | Hours | Marks |
|---|---|---|---|
| 01 | **INTRODUCTION AND SECURITY TRENDS**<br>What is computer security and why we need it?<br>Threats to security:<br>Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, steps in attack.<br>Types of attack:<br>Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks, Malware: Viruses, Logic bombs.<br>Security Basics:<br>Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security<br>Access control**:**<br>Discretionary, Mandatory, Role based. Authentications: Certificates Tokens, Multifactor. | 08 | 15 |
| 02 | **ORGANIZATIONAL/ OPERATIONAL SECURITY**<br>Role of people in security:<br>Password selection Piggybacking, Shoulder surfing,- Dumpster diving Installing unauthorized software / hardware, Access by non employees, Security awareness individual user responsibilities, Security Policies, standards, procedures and guidelines.<br>Physical security:<br>Access controls. Biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes, Physical barriers Social Engineering. | 08 | 10 |
| 03 | **CRYPTOGRAPHY AND PUBLIC KEY INFRASTRUCTURE**<br>Encryption algorithm/Cipher, Caesar's cipher, shift cipher, substitution software, Vigenere cipher Transposition. techniques, Steganography Hashing, SHA. Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital signatures, Key escrow.<br>Public key infrastructures**:**<br>basics, digital certificates, certificate authorities, registration authorities, steps for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate, Centralized or decentralized infrastructure, private key protection.<br>Trust models:<br>Hierarchical, peer to peer, hybrid models. | 10 | 25 |
| 04 | **NETWORK SECURITY**<br>Firewalls**:** working, design principles, trusted systems, Kerberos.<br>Security topologies: security zones, DMS, Internet, Intranet, VLAN, security implication, tunneling. | 08 | 10 |

| | | | |
|---|---|---|---|
| | IP security**:** overview, architecture, IPSec, IPSec configurations, IPSec security Virtual Private Network.<br>Email security: security of email transmission, malicious code, spam, mail encryption. | | |
| **05** | **SYSTEM SECURITY:** Intruders, Intrusion detection systems (IDS), host based IDS, network based IDS Password Management, vulnerability of password, password selection strategies, components of a good password.<br><br>Operating system security: Operating system hardening, general steps for securing windows operating system, Hardening Unix/Linux based operating system, updates , hot fix, patch, service pack | **08** | **10** |
| **06** | **APPLICATION AND WEB SECURITY**<br>Application hardening, application patches, web servers, active directory. Web security threats, web traffic security approaches, secure socket layer and transport layer security, secure electronic transaction.<br>Software development:<br>secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing. | **06** | **10** |
| | **TOTAL** | **48** | **80** |

**Recommended Books:**

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

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : OPERATING SYSTEM**

**SUBJECT CODE : CO5004**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TH | PR | PAPER HRS | TH | INT | PR | OR | TW | TOTAL |
| 04 | 02 | 03 | 80 | 20 | -- | 25** | 25* | 150 |

**Pre-requisites:** The Student must know the following concepts:

1. Basic Knowledge of computer concept and operations
2. Basic Knowledge of computer network

**Objectives:** The student will be able to

1. Learn the various milestones in the history of operating systems and the modern trends in operating systems.
2. Understand the features and functions of operating systems provided by various system calls.
3. Understand a process, deadlock & the concept of context switching & multiprogramming.
4. Learn various memory management and file management techniques.
5. Implement various algorithms of scheduling.
6. Compare and contrast the various standard solutions to operating system problems.
7. Understand the Unix VI editor and Unix utilities.

| Subject Title: OPERATING SYSTEM | Subject Code: CO5003 |
|---|---|

**Content: Theory**

| Unit | Name of the Topic | Hours | Marks |
|---|---|---|---|
| **01** | **INTRODUCTION**<br>Operating system, Evolution, Generations -1st, 2nd, 3rd, 4th. Mainframe Systems-Batch, Multi programmed, multitasking, time sharing, Desktop, Multiprocessor Systems, Distributed Systems. Clustered Systems, Real Time Systems. | **06** | **10** |
| **02** | **OPERATING SYSTEM STRUCTURES**<br>System components:<br>Process management, Main memory management, File management, I/O system management, Secondary storage management.<br>Operating system services:<br>System calls – Uses, process control, file management, Device management, Information maintenance, communication**.**<br>Operating system structure:<br>Simple structure, layered, monolithic, microkernel. Booting. | **10** | **15** |
| **03** | **PROCESS MANAGEMENT**<br>Processes:<br>Concept, process, state, process control block.<br>Process scheduling:<br>Scheduling queues, scheduler, and context switch.<br>Operations on processes:<br>Creation, termination, Inter process communication.<br>Threads- Benefits, user and kernel threads.<br>Multithreading Models:<br>Many to one, one to one, many to many | **10** | **20** |
| **04** | **SCHEDULING**<br>Scheduling:<br>Objectives, concept, criteria, CPU and I/O burst cycle.<br>Types of Scheduling:<br>Pre-emptive, Non pre-emptive.<br>Scheduling Algorithms: First come first served (FCFS), Shortest job first (SJF), Round Robin (RR), Priority.<br>Other Scheduling: Multilevel, Multiprocessor, real-time<br>Deadlock:<br>System model, principle necessary conditions, mutual exclusion, critical region.<br>Deadlock handling:<br>Prevention and avoidance. | **12** | **20** |
| **05** | **FILE SYSTEM AND MEMORY MANAGEMENT**<br>File:<br>Concept, Attributes, Operations, Types, Structure<br>Access Methods – Sequential, Direct.<br>Swapping, Allocation Methods-Contiguous, Linked, Indexed.<br>Directory Structure:<br>Single level, Two levels, Tree Structure.<br>Protection:<br>Types of accesses, Access control. | **10** | **15** |

| | | | |
|---|---|---|---|
| | Basic Memory Management :<br>Partitioning, Fixed & Variable.<br>Free Space management techniques :<br>Bitmap, Linked List.<br>Virtual Memory:<br>Concept, Paging, Page fault, Page Table.<br>Page Replacement algorithms – FIFO (First in First out)<br>Optimal Page replacement, LRU (Least recently used),<br>NRU (Not recently used) | | |
| | **TOTAL** | **48** | **80** |

**Practical:**

**Skills to be developed:**

**Intellectual skills:**

1. Basic Operating system concepts must be known.
2. Apply logic to solve given problem.
3. Familiar with basic programming languages. (e.g. C)

**Motor skills:**

Hands on LINUX operating system.

**List of Practical:**

1. Identify the major desktop components, interfaces and their functions Differentiate the various Windows Operating system (Windows 9x, Windows NT, Windows 2000 & Windows XP)
2. Use of file and directory manipulation commands – ls, rm, mv, cp, join, split, cat, head, tail, touch, diff, 125omm., pr, chmod, mkdir, rmdir, cd, pwd, dir, cmp.
3. Use of text processing and communication commands – tr, wc, cut, paste,
   a. spell, sort, grep, mesg, talk, wall, write, who, who am I ,news, mail.
4. Use of general purpose and process commands – ps, wait, sleep, exit, kill, bc,
   a. date, time, cal, clear, banner, tty, script, su, man.
5. Use of vi editor & perform all editor commands.
6. Write and execute shell script to display the following output.

   i) Menu: List of files.

      a. Processes of user.
      b. Today's date
      c. Users of the system
      d. Quit to UNIX

   ii) To check every argument and carry out the following:

      a. Argument is a directory, then display the number of files and directories present in that directory.
      b. If argument is a file, then display the size of file.
      c. If argument does not exist then create the directory.
7. Write and execute the program me to implement round robin scheduling Algorithm.

**Recommended Books:**

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

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : NETWORK MANAGEMENT AND ADMINISTRATION**

**SUBJECT CODE : CO5005**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **PR** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 02 | 02 | -- | -- | -- | -- | 25** | 25* | 50 |

**Pre-requisites:** The Student must know the following concepts:

1. Basic networking fundamentals like LAN, WAN, MAN.
2. Knowledge of S/W and H/W components in computer like printer, modem etc
3. Layers of OSI models, topologies

**Objectives:** The Student will be able to

1. Provide the knowledge of networking jobs.
2. Provide knowledge about DHCP and all protocols
3. Understand practical installation of windows server 2003, active directories
4. Create users, groups, printer installation
5. Understand trouble shooting and security of networks

**Subject Title: NETWORK MANAGEMENT AND ADMINISTRATION**

**Subject Code: CO5005**

**Content: Theory**

| Unit | Name of the Topic | Hours |
|---|---|---|
| **01** | **EXPLORING DIRECTORY SERVICES AND REMOTE NETWORK ACCESS**.<br>Network Related Jobs :<br>Network Administrator, Network Engineer, Network Architecture / Designer, Other Network Related Jobs.<br>Directory Services :<br>Define Directory Services, Definition of Novell e-directory, Windows NT domains, Microsoft's Active Directory, X500 Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves.<br>Active Directory Architecture :<br>Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests.<br>Remote Network Access:<br>Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV.<br>Virtual Private Network :<br>VPN Protocols, Types of VPNs, VPN Clients, and SSL VPNs. | **06** |
| **02** | **NETWORK CONNECTION AND PRINTING SERVICES**<br>Dynamic Host Configuration Protocol (DHCP):<br>DHCP Origins, Reverse Address Resolution Protocol (RARP), The Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture.<br>Introduction to Domain Name System(DNS):<br>DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration.<br>Understand Network Printing Concepts :<br>Understand network printing concepts, Locally connected print devices, Setting up local print devices, Shared print devices, Sharing locally attached print devices, Describe Windows network printing, Add Print Wizard. | **06** |
| **03** | **IMPLEMENTATION OF NETWORK**<br>Designing Network:<br>Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs – Choosing Network Type, Choosing Network Structure, Choosing Servers.<br><br>Installing and Configuring Windows 2003 Server :<br>Preparing for Installation, Creating Windows 2003 server boot disk, Installing Windows 2003 server, Configuring server/ client. | **06** |

| | | |
|---|---|---|
| | Setting Windows 2003 server:<br>Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration | |
| **04** | **ADMINISTERING WINDOWS 2000 SERVER (THE BASICS)**<br>Working With User Accounts:<br>Adding a User, Modifying User Account, Deleting or Disabling a User Account.<br>Working With Windows 2000 Security Groups:<br>Creating Group, Maintaining Group Membership.<br>Working with Shares:<br>Understanding Share Security, Cresting Shares, Mapping Drives.<br>Administering Printer Shares:<br>Setting up Network Printer.<br>Working with Windows 2000 Backup:<br>Using Windows 2000 Servers Backup Software. | **06** |
| **05** | **TROUBLESHOOTING AND SECURITY OF NETWORK**<br>Understanding the Problem:<br>Troubleshooting, Segmenting the Problem, Isolating the Problem, Setting Priorities.<br>Troubleshooting Tools:<br>Hardware Tools, Software Tools, Monitoring and Troubleshooting Tools.<br>Internal Security:<br>Account Security, File and Directory permissions, Practices and user education.<br>External Threats**:**<br>Front Door threats, Back Door threats, Denial services threats, Viruses, worms and other Malicious codes. | **08** |
| | **TOTAL** | **32** |

**Practical:**

**Skills to be developed:**

**Intellectual skills:**

1. Fault finding of network.
2. Troubleshooting of network.
3. Proper installation of network.

**Motor skills:**

Proper handling of Computer System hardware**.**

**List of Practical:**

1. Creating Windows 2003 Server Boot Disk.
2. Installing Windows 2003 Server.
3. Installing Active Directory.
4. Creating AD Objects.
5. Setting up Local Print Device.
6. Installing and Configuring a Network – Capable Print Device.
7. Create new Users & give the Permission.
8. Group of four students prepare a mini report on Latest Networking Technology.

**Recommended Books:**

| Sr. No. | Author | Title | Publication |
|---|---|---|---|
| 01 | Craig Zacker | The Complete Reference Networking | Tata McGraw-Hill Edition |
| 02 | Bruce Hallberg | Networking A Beginner's Guide | Tata McGraw-Hill Edition |
| 03 | Richard A. McMohan, Sir | Introduction to Networking | Tata McGraw-Hill Edition |
| 04 | Microsoft Press | Networking + Certification Training Kit | |
| 05 | Microsoft Press | MCSE Training Kit Networking Essential Plus | |

**Sources of Information –** 1) Computer Magazine 2) Computer Today

3) PC Quest 4) Information Technology

5) Internet 6) Linux for U

**COURSE NAME : DIPLOMA IN COMPUTERING ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : DATABASE MANAGEMENT (ELECTIVE I)**

**SUBJECT CODE : CO5006**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TH | PR | PAPER HRS | TH | INT | PR | OR | TW | TOTAL |
| 04 | 04 | 03 | 80 | 20 | -- | 25** | 25* | 150 |

**Pre-requisites:** The Student must know the following concepts:

1. Basic Knowledge of SQL and DBMS concepts.
2. Basic Knowledge of client server architecture.

**Objectives:** The Student will be able to

1. Understand the Oracle database architecture, control files.
2. Create database and give properties.
3. Manage user, roles and objectives.
4. Understand Oracle backup and recovery and network.

| Subject Title: DATA BASE MANAGEMENT(ELECTIVE I) | Subject Code: CO5006 |
|---|---|

**Content: Theory**

| Unit | Name of the Topic | Hours | Marks |
|---|---|---|---|
| 01 | **ORACLE ARCHITECTURE**<br>Components of Oracle Architecture:<br>Structures for connecting a user to an oracle Instance, Common database administrative tools for DBA, features of the oracle universal Installer, Optimal flexible architecture, Setting of password file authentication, main components of Oracle enterprise manager and their uses.<br>Maintaining Control file:<br>Use of control file, Control file, Multiplex and manage the control file, manage control file with Oracle managed files. Managing an Oracle Instance: Create and manage initialization parameter files, configure OMF, startup & shutdown an instance, monitor the use of diagnostic files.<br>Creating a Database:<br>Prerequisite for database creation, creating a database using oracle database configuring assistant, Creating a database manually, Maintaining redo log files: Purpose & structure of online redo log files, Control lock switches and check points, Multiplex and maintain online redo log files, Manage online redo log files with OMF. | 10 | 15 |
| 02 | **MANAGING USERS, ROLE AND DATABASE OBJECTS.**<br>Managing users, privileges and roles:<br>Creating new database users alter and drop existing database users, Monitor information about existing users, Identify system and object privileges, grant and revoke privileges, identify auditing capabilities, create and modify roles, Control availability of roles, remove roles, user predefined roles, display role information from the data dictionary.<br>Managing table spaces:<br>Managing table spaces, data files, tables, undo data and indexes logical structure of table spaces within the database, create table spaces, change the size of the table space allocate table space for temporary segments, change the status of table spaces, change the storage setting of table spaces, implement Oracle managed files, various methods of storing data, oracle data types, distinguish between an extended versus a restricted row id, structure of a row, creating regular and temporary tables, manage storage structures within a table, reorganize truncate, drop a table, purpose of undo data, automatic undo management different types of indexes and their uses creating, reorganizing and dropping indexes, get index information from the data | 05 | 15 |

| | | | |
|---|---|---|---|
| | dictionary. Storage structure and relationships. Logical structure of segments, segment types and uses, keywords that control block spaces usage, get information about storage structures from the data dictionary.<br>Data dictionary content and usage :<br>Data dictionary components, contents and uses of data dictionary, query the data dictionary. Managing password security, resources and data integrity, Manage passwords using profiles, administrator profiles, control use of resources using profile, implement data integrity constraints, maintain integrity constraints, obtain Constraint information from the data dictionary. | | |
| **03** | **ORACLE BACKUP AND RECOVERY**<br>Backup and recovery overview :<br>Basics of database backup, restore and recovery, types of failure in an Oracle environment, backup and recovery strategy. Instance and media recovery structures.<br>Oracle processes, memory structures and files related to recovery, importance of check points, redo log files and Archived log files, instance recovery.<br>Configuring the database archiving mode Difference between archive log and no archive log modes; configure a database for archive log mode, automatic archiving, multiple archiving processes.<br>Oracle recovery manager overview and configuration.<br>RMAN features, components, configuring RMAN.<br>User managed backups and RMAN backups.<br>User managed backups and recovery operations, backup issues with read table spaces, perform closed and open database backups, backup the control file, cleanup after a failed online backup, DB verify utility to detect corruption, types of RMAN specific backups backing up with RMAN, copy command to create image copies. User managed complete recovery and RMAN complete recovery.<br>Recovery in non archive log mode and complete recovery in archive log mode using user managed and RMAN, restore data files to different locations, relocate and recover a table pace by using archived redo log files.<br>User managed incomplete recovery and RMAN incomplete recovery.<br>Necessity of incomplete recovery, Methods for incomplete recovery, incomplete recovery with user managed backups, incomplete recovery using RMAN and using enterprise manager, recovery of the control file, recovery through reset logs.<br>RMAN maintenance and recovery catalog creation and maintenance.<br>Cross checking of backups, updating the repository, changing the status of backup and copies, catalog backups made with operating system commands, | **15** | **25** |

| | | | |
|---|---|---|---|
| | contents of recovery catalog, creating the recovery catalog and maintaining it by using RMAN commands, using RMAN to register, resynchronize and reset a database, querying recovery catalog to generate reports and lists, create, store and run scripts. | | |
| **04** | **ORACLE NETWORKING**<br>Networking overview and basic oracle net architecture. Managing complex networks, Oracle networking add-on solutions, components of Oracle net layered architecture, oracle net services role, web client connections through oracle networking.<br>Configuring oracle networking:<br>Establishing a session, creating and managing a listener, database registration, the listener control utility, techniques for name resolution, configuring service aliases, advanced connection options, testing oracle net connections.<br>Managing shared servers :<br>Limitations of dedicated server architecture, shared server architecture, configuring shared server, monitoring the shared server when to use the shared server | **10** | **15** |
| **05** | **ORACLE PERFORMANCE AND TUNING OVERVIEW**<br>Tuning application design, tuning SQL, tuning memory usage, tuning data access, tuning data manipulation, tuning physical storage, reducing network traffic, using STATSPACK and the automatic work load repository, using STATSPACK, tuning tools, alert log, background trace file, server generated alerts, user trace files. | **08** | **10** |
| | **TOTAL** | **48** | **80** |

**Practical:**

**Skills to be developed:**

**Intellectual Skills:**

1. Use of programming language constructs in program.
2. Apply different logics to solve given problem.
3. Identify different types of errors as syntax semantic, fatal, linker & logical.

**Motor Skills:**

1. Proper handling of Computer System.
2. Development of programs using database connectivity.

**List of Practical:**

1. Demonstration of Installation of Oracle database software.
2. Create a database with database configuration assistant.
3. Starting up and shutting down database with SQL and Plus and with database control and viewing parameters with database control.
4. Use enterprise manager to create after and drop a table space.
5. Use enterprise manager to grant system and manage database user.
6. Use enterprise manager to grant system and object privileges.
7. Use enterprise manager to create and manage roles and profiles.
8. Create database objects and constraints using enterprise manager.
9. Create and Use password profiles.
10. Create a listener with database control, oracle net service alias and configure dynamic service registration.
11. Configure and verify shared server and configure a client to choose the connection type.
12. Create and undo table space with database control and monitor undo with SQL plus.
13. Detect and resolve log connection.
14. Instance recovery and MTTR to demonstrate the effect of check pointing on MTTR.
15. Multiplex the redo log and translation the database to archive log mode.
16. Run a whole database backup and back up the control file to trace with SQL plus and manage RMAN backups.
17. Recovery the data from loss of control file and multiplex online redo log file. Recovery a lost of multiplexed online log file and recovery the data from loss of non critical data files.
18. Set a listener password with isnrct l and creating a listener for external procedural calls.
19. Configure RMAN.
20. Create backup sets using RMAN and managing backups.
21. Set, view and clean alerts using DBMS_SERVER_ALERT_AMI and database.
22. Perform an incomplete recovery with RMAN, and carrying out control file auto backup and restore.
23. Use the SQL tuning adviser for database management.

**Recommended Books:**

| Sr.No | Title | Author | Publisher |
|---|---|---|---|
| 01 | Oracle Database Log | --- | OCP Cerification All in one Exam guide |
| 02 | Oracle Database DBA Handbook | ----- | Oracle Pears |
| 03 | Oracle 9I Database: Fundamentals II exam guide | Rama Velpuri | Oracle Pears |

**Websites:**

1. www.oracle.com/technology /pub/articles/tech_dba.html
2. www.oracle.com/technology /oramag/oracle/03-may/0330cp.html

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : WINDOWS PROGRAMMING (ELECTIVE I)**

**SUBJECT CODE : CO5007**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **PR** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 02 | 04 | 03 | 80 | 20 | -- | 25** | 25* | 150 |

**Pre-requisites:** The Student must know the following concepts.

1. Knowledge of VB, GUI, Windows etc.
2. Knowledge of logical programming.

**Objectives:** The Student will be able to

1. Use visual environment.
2. Write simple programs using VC++.
3. Develop program for drawing dot, lines and shapes.
4. Handle keyboard and mouse input through programs.
5. Create checkbox, scroll bats etc.

**Subject Title: WINDOWS PROGRAMMING (ELECTIVE I) Subject Code: CO5007**

**Content: Theory**

| Unit | Name of the Topic | Hours | Marks |
|---|---|---|---|
| 01 | **OVERVIEW OF WINDOWS MESSAGING.**<br>The Windows environment, History of Windows, aspects of Windows, Windows Programming Options, APIs and Memory Models, The Programming Environment, Your First Windows Program, The Message Box Function, A Brief History of Character, Sets 20 American Standards, Wide Characters and C, The char Data Type, Windows' String Functions, Using printf() in Windows, Formatting Message Box, Registering the Window Class, Creating the Window, Displaying the Window, The Message Loop, The Window Procedure. . | 06 | 20 |
| 02 | **GDI AND BASIC DRAWINGS**<br>An Introduction to GDI, The Structure of GDI, The GDI Philosophy, The GDI Function Calls, The GDI Primitives, The Device Context:<br>Drawing Dots and Lines, Setting Pixels, Filling in the Gaps, Drawing Filled Area, The GDI Mapping Mode Rectangles, Regions, and Clipping. | 08 | 20 |
| 03 | **THE KEYBOARD**<br>Keyboard basics, keystrokes and characters, using keystroke messages, character messages, keyboard messages and character sets, The KEYVIEW1 Program, The Foreign-Language keyboard problem, The Caret (not the Cursor), The Caret functions. | 06 | 15 |
| 04 | **THE MOUSE**<br>Mouse basics, Client-Area mouse messages, simple mouse processing: an example, mouse double-clicks, non-client -area mouse messages, the Hit-Test message, A sample program emulating the mouse with the keyboard, using child process, Windows for Hit-Testing, capturing the mouse. | 06 | 10 |
| 05 | **CLIENT WINDOW CONTROLS**<br>The Button Class, Creating the Child Windows, Push Buttons, Check boxes, Radio buttons, Group boxes, Changing the Button Text, Visible and Enabled Buttons, Buttons and Input Focus, Controls and colors, System Colors, The Button Colors, The WM_CTLCOLORBTN Message, The Scroll Bar Class 383 The COLORS1 program coloring the background, coloring the scroll bars and static text, The List box Class, List Box Styles, putting Strings in the List Box, Selecting and extracting entries, A simple List Box application. | 06 | 15 |
| | **TOTAL** | **32** | **80** |

**Practical:**

**Skills to be developed:**

**Intellectual skills:**

1. Use of programming language constructs in program implementation.
2. Apply different logics to solve given problem.
3. Write program using different implementations for the same problem.
4. Identify different types of errors as syntax semantic, fatal, linker & logical.
5. Debugging of programs.

**Motor skills:**

1. Proper handling of Computer System.
2. Basic understanding of GUI.

**List of Practical:**

1. Demonstration of Visual Environment
2. Writing simple VC++ programs
3. Writing programs on drawing dots, lines, rectangles, filling different shapes.
4. Program on reading keystrokes from Keyboard.
5. Program on displaying text at desired window.
6. Finding size, Resizing windows.
7. Program on handling mouse.
8. Creating different controls (such as checkbox, scrollbar, etc).
9. Program on timer demonstration .

**Recommended Books:**

| Sr.no | Title | Author | Publisher |
|---|---|---|---|
| 01 | Charles Petzold | Programming Windows | Microsoft Press |
| 02 | Brent E. Rector<br>Joseph M. Newcomer | Win32 Programming | Addison Wesley |

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : PROFESSIONAL PRACTICES -IV**

**SUBJECT CODE : CO5008**

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **TUT** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| | 02*** | -- | -- | -- | -- | | 50* | 50 |

**Prerequisites**: The student must know the following concepts:

1. Communication skills.
2. Basic technological concepts.

**Objectives**: The student will be able to

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

| Subject Title: PROFESSIONAL PRACTICES-IV | Subject Code: CO5008 |
|---|---|

**Content: Theory**

| Sr. No. | Activity | Hours |
|---|---|---|
| 01 | **INDUSTRIAL VISITS (any 2)**<br>Structured industrial visits be arranged and report of the same should be submitted by the individual student,<br>Visit any IT industry/ computer center, Study their network (Cable layout, devices used/software/costing) | 10 |
| 02 | **GUEST LECTURES**<br>By professional / industrial expert be organized from any three of the following areas:<br>Artificial Intelligence,<br>ERP,<br>Software Engineering,<br>DBMS,<br>GUI.<br>The brief report is to be submitted on the guest lecture by each student as a part of Termwork. | 06 |
| 03 | **INFORMATION SEARCH :**<br>Each student will search topic for Industrial project of sixth semester and prepare synopsis and project plan. Get it approved from concerned Authority. | 08 |
| 04 | **GROUP DISCUSSION:**<br>The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic group discussions may be selected by the faculty members. Some of the suggested topics are:<br>Computer graphics<br>Ethics in software<br>Advanced technology in hardware<br>Software companies. | 04 |
| 05 | **SEMINAR AND ACADEMIC PROJECT:**<br>Seminar should be on selected industrial project's synopsis and week wise plan for completion of project. Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time - 10 minutes)<br>Present one's own project report. | 08 |
| | **TOTAL** | 36 |

**COURSE NAME : DIPLOMA IN COMPUTER ENGINEERING**

**COURSE CODE : CO**

**SEMESTER : FIFTH**

**SUBJECT TITLE : DEVELOPMENT OF GENERIC SKILLS- II**

**SUBJECT CODE : CO5011**

## TEACHING AND EXAMINATION SCHEME:

| Teaching Scheme | | Examination Scheme | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TH** | **TUT** | **PAPER HRS** | **TH** | **INT** | **PR** | **OR** | **TW** | **TOTAL** |
| 01 | -- | 02 | 40 | 10 | -- | -- | -- | 50 |

**Pre-requisite:** The student must know the following concept:

1. Development of generic skills-I.

**Objectives:** The **s**tudent will be able to

1. Acquire information from different sources and present it in his/her own words- own language
2. Prepare himself/herself for presenting certain topic in such a way that he/she may impress the audience.
   One should take care of:
   a) Body language
   b) Eye contact
   c) Voice pitch
   d) Facial expressions
   e) Overall impact on the audience

| Subject Title: DEVELOPMENT OF GENERIC SKILLS-II | Subject Code: CO5011 |
|---|---|

**Contents: Theory**

| Unit | CONTENTS | Hours | Mark |
|---|---|---|---|
| 01 | **SOCIAL SKILLS**<br><br>Society, social structure, develop sympathy and empathy. | 01 | 03 |
| 02 | **SWOT ANALYSIS**<br><br>Concept , How to make use of SWOT Analysis | 01 | 03 |
| 03 | **INTER PERSONAL RELATION**<br><br>Sources of conflict, Resolution of conflict<br><br>Ways to enhance interpersonal relations | 02 | 05 |
| 04 | **PROBLEM SOLVING**<br><br>1. Steps in problem solving,<br>2. Identify and clarify the problems<br>3. Information gathering related to problem,<br>4. Evaluate the evidence,<br>5. Consider alternative solutions and their implications<br>6. Choose and implement the best alternative<br>7. Review<br>II)Problem solving technique.(any one technique may be considered)<br><br>1) Trial and error 2) Brain storming,<br><br>3) Lateral thinking | 02 | 05 |
| 05 | **PRESENTATION SKILLS**<br>a) Body language<br>b) Dress like the audience<br>c) Posture, Gestures, Eye contact and facial expressions.<br>d) Presentation Skill<br>e) Stage fright<br>f) Voice and language - Volume, Pitch, Inflection, Speed, Pause<br>g) Pronunciation, Articulation, Language,<br>h) Practice of speech.<br>Use of aids -OHP,LCD projector, white board. | 04 | 11 |
| 06 | **GROUP DISCUSSION AND INTERVIEW TECHNIQUE**<br>• Introduction to group discussion<br>• Ways to carry out group discussion, Parameters— Contact, body language, analytical and logical thinking, decision making<br>• Interview technique: Necessity, Tips for handling common | 02 | 05 |

| | | | |
|---|---|---|---|
| | questions. | | |
| **07** | **WORKING IN TEAMS**<br>• Understand and work within the dynamics of a groups.<br>• Tips to work effectively in teams.<br>• Establish good rapport, interest with others and work effectively with them to meet common objectives.<br>• Tips to provide and accept feedback in a constructive and<br>• Considerate way<br>• Leadership in teams, handling frustrations in group. | **02** | **05** |
| **08** | **TASK MANAGEMENT**<br>• Introduction<br>• Task identification<br>• Task planning, organizing and execution.<br>• Closing the task | **02** | **03** |
| | **TOTAL** | **16** | **40** |

**Mini Project:** On Task Management. Decide any to be completed in a stipulated time with the help of teacher. Write a report considering various steps in task management.

**Recommended Books**:

| Sr. No. | Title of the book | Author | Publisher |
|---|---|---|---|
| 01 | Adams Time management | Marshall Cooks | Viva Books |
| 02 | Basic Managerial Skills for All | E.H. Mc Grath , S.J. | Pretice Hall of India, Pvt Ltd |
| 03 | Body Language | Allen Pease | Sudha Publications Pvt. Ltd. |
| 04 | Creativity and problem solving | Lowe and Phil | Kogan Page (I) P Ltd |
| 05 | Decision making & Problem Solving | Adair, J | Orient Longman |
| 06 | Develop Your Assertiveness | Bishop , Sue | Kogan page India |
| 07 | Assertiveness | Marion E Haynes | Orient Longman |