### Sardar Patel University

**Course: BCA – 301**

**MIS (Management Information System)**

**External marks: 80**

**Internal marks: 40**

**Course Credit: 03**

**University Examination duration: 3 hrs**

**Number of Credits/Lect. per week: 03**

| Unit-I | - Introduction to MIS, Function of MIS, Problems with MIS, Knowledge requirements for MIS(7 areas), General system concept, DSS, EIS, ES, 4GL, IT & MIS : What is IT? Is computer essential for MIS?  
- Office supporting system(Whole)  
- Computer and MIS  
- Computer & MIS Data Processing System  
- Characteristics of DPS  
- Scope of Trans. Processing  
- Example of Sales Processing |
|---|---|
| Unit-II | - Information, Data & Communication – Concepts, Classification of Information, Characteristics of Information  
- Communication System, Communication methods, Information in an organization, Case Study |
| Unit-III | - Planning and Planning terms, Objectives, Problems, Type, Source of Planning Information System Concepts (ch.3 to ch.4)  
- Structure elements (CH.3)  
- Objectives & types (CH.4)  
- Tools of planning, Introduction to Pert-CPM (O-R-SD Sharma) |
| Unit-IV | - Working with people (Ch.12), Model of Organization behaviour (ch.4), Social System & organization culture  
- Case Study  
- Industry  
- Academic  
- Employee Vs Employer  
- Employee Vs Organization |
| Unit-V | - Industrial Behavior, formal and informal relationship, Job satisfaction, Change its resistance & management |
| Unit-VI | - Concept of controlling management, Control cycle, Different Feedback loops, Principles of controlling, Multiple control feedback, Scope of management control  
- Total Quality Management, Case Study – TQM |

**Reference Books:**

### Sardar Patel University

**Course: BCA – 302**

**Visual Programming**

<table>
<thead>
<tr>
<th>Unit-I</th>
<th>Visual Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Introduction, Its Features, Introduction to Project types</td>
<td></td>
</tr>
<tr>
<td>- Development Environment: Menubar, Toolbars, Project Explorer, Toolbox, Properties Window, Form Designer, Form Layout, Immediate Window</td>
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<tr>
<td>- Datatypes, Variables: Declarations, Conversion, Forcing Declaration, Scope, lifetime, Special values</td>
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<tr>
<td>- Control Structures: If and select case structure</td>
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<tr>
<td>- Looping structures : While, Do while, For…Next, Do…Loop until</td>
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</tr>
<tr>
<td>- Displaying Message- Messagebox and Inputbox, Subroutines and functions with examples</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Unit-II</th>
<th>Designing user Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Forms and MDI Form</td>
<td></td>
</tr>
<tr>
<td>- Functions : String: len, mid, ucase, lcase, str, val, strconv, isnull, empty</td>
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<tr>
<td>- Numeric: cstr, isnumeric</td>
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<tr>
<td>- Data &amp; Time : date, time, now, cdate</td>
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<tr>
<td>- Sample application</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit-III</th>
<th>Arrays: Declaration and use of one, two or multi-dimensional arrays, Dynamic Arrays</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Modules: Creating and using</td>
<td></td>
</tr>
<tr>
<td>- Handling Text files: Opening, Closing, Reading and Writing in Random mode</td>
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<tr>
<td>- Advance controls: Toolbar, Imagelist, Statusbar, Progressbar, Dialogbox, Tab, Treeview, Listview, Slider, Datepicker, Richtextbox, Monthview, Maskedit.</td>
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<tr>
<td>- Sample applications on advance controls</td>
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</table>

<table>
<thead>
<tr>
<th>Unit-IV</th>
<th>Connecting to Databases</th>
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<tbody>
<tr>
<td>- Introduction to DAO and RDO</td>
<td></td>
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<tr>
<td>- Data Control: Properties &amp; Methods</td>
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<tr>
<td>- The ADO Control:</td>
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<tr>
<td>- Programming Active Data Objects, Establishing connections, Executing SQL Statements</td>
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<tr>
<td>- Manipulating recordset objects</td>
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<tr>
<td>- Data Bound controls : Datagrid, Flexgrid, Data Bound ListBox and Combobox</td>
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<tr>
<td>- Error Handling and Debugging, Types of Errors, Error Debugging, Debug Object &amp; The Err Object</td>
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<tr>
<td>- Sample Applications on database connections</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit-V</th>
<th>Data Reports</th>
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<tbody>
<tr>
<td>- Setting up data environment, connection, command</td>
<td></td>
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<tr>
<td>- Building reports in designer, building interface to reports</td>
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<tr>
<td>Unit-VI</td>
<td>Introduction to ASP:</td>
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<tr>
<td>- Grouping &amp; passing parameters, Testing &amp; running reports</td>
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<tr>
<td>- Creating ActiveX controls &amp; registering</td>
<td></td>
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<tr>
<td>- User defined datatypes, properties and events</td>
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<tr>
<td>- Package &amp; deployment of application</td>
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<tr>
<td>- Client server interaction, Building parameter strings, contacting web server &amp; server application</td>
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<tr>
<td>- Active Server Pages, creating pages, included files</td>
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<tr>
<td>- Use of Active Server Objects</td>
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<tr>
<td>- Intrinsic Objects, Basic objects, Response, Request, Server, Start &amp; End Events</td>
<td></td>
</tr>
<tr>
<td>- Setting ODBC data source using ActiveX data objects</td>
<td></td>
</tr>
</tbody>
</table>

**Reference Books:**
1. Mastering Visual Basic 6- Evangelos Petroutsos BPB Publication

**Additional References:**
2. How to program Visual basic 6- Deital & Deital Pearson Education
# Computer Graphics & Multimedia Applications

**Sardar Patel University**  
**Course: BCA – 303**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topics</th>
</tr>
</thead>
</table>
| **Unit-I** | A survey of major applications of Computer Graphics  
Overview of different video display Devices: CRT, Raster scan, Color Monitors, DVST, Flat Panels  
Input Devices: Keyboard, mouse, Trackball, Spaceball, Joystick, Data Glove, Digitizers, Image Scanner, Touch Panel, Light pen & Voice system.  
Hardecopy Devices: Printers and Plotters  
Graphics Software & coordinate representation, Graphics functions, Software Standards |
| **Unit-II** | Output Primitives: Points, Lines, Circles  
Line Drawing Algorithms (without program): Digital Differential Analyzer (DDA) and Bresenham  
Circle generating algorithm(without program): Midpoint Circle Algorithm  
Filled area primitives  
Scan Line Polygon fill algorithm (with procedure)  
Inside – Outside tests, Boundary- fill algorithm (with procedure)  
Flood-Fill Algorithm (with procedure), Cell Array, Character generation, Output Primitive function  
Attributes: Line, Color, Areafill, Character  
Definitions: Bundled attributes, Bundled table, Aspect source flag, Inquiry Function, Aliasing, Anti-aliasing Methods: Super sampling, area sampling & Pixel phasing |
| **Unit-III** | Transformations: Translation, Rotation, Scaling, Reflection & Shear  
Definition: Affine transformations, raster ops, block transfer, bitBit, pixBit, typical raster functions  
Viewing Pipeline, Window-to-Viewport transformation.  
Clipping & Point Clipping  
Line clipping (without program)  
- Cohen Sutherland line clipping algorithm  
- Liang-barsky line clipping algorithm  
Polygon Clipping(without program)  
- Sutherland Hodgeman polygon clipping algorithm  
- Weiler –Atherton polygon clipping  
- Curve clipping, Text clipping, Exterior clipping  
Logical classification of input devices  
Input nodes (request, sample & event mode – Definitions)  
Interactive Picture Construction Techniques: Rubber bending methods, Zooming, Dragging  
Display Techniques: Parallel Projection, Perspective projection, Depth Cueing, Surface Rendering, 3D & Stereoscopic views |
| **Unit-IV** | Multimedia: Definition, Various facets of Multimedia, Classification  
Multimedia System Configuration, Varieties of multimedia software  
Introduction Digital Media, Digital Audio & Sound card fundamentals  
Sound card functionalities, Audio jacks, connections  
Digital Audio playback & Audio editing & need |
<table>
<thead>
<tr>
<th>Unit-V</th>
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</thead>
<tbody>
<tr>
<td>- Two-dimensional animation &amp; Three-dimensional animation Technology</td>
<td>- Names of animation software tools</td>
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<table>
<thead>
<tr>
<th>Unit-VI</th>
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</thead>
<tbody>
<tr>
<td>- Two-dimensional animation</td>
<td>- Drawing and painting, Tools, transforming objects</td>
<td>- Advance drawing techniques</td>
</tr>
<tr>
<td>- Importing graphics</td>
<td>- Animation</td>
<td>- Motion tween and shape tween</td>
</tr>
<tr>
<td>- Animation</td>
<td>- Using Timeline effects</td>
<td>- Using Layers</td>
</tr>
</tbody>
</table>

Reference Books:
3. Macromedia Flash MX 2004 in 24 hours by Phyllip Kerman, Pearson Education
Unit I
- Introduction: Software and Software Engineering
- General Characteristics of Software & development process
- Quality metrics
- Phases in Software development
- Effort and Error Distribution
- Process Model
- Waterfall, Prototype, Iterative enhancement, spiral
- Role of Management and Metrics

Unit II
- Introduction: SRS(Meaning & Role)
- Problem Analysis
  - Structuring information
  - FDD,DFD,DD Structured analysis
- Requirement Specifications
  - Characteristics and Components of SRS
  - Specification language (Structured English, Regular Expression and Decision Table)
  - Structure of SRS
- Validation of SRS
- Metrics Overview
- Monitoring and Control

Unit III
- Introduction: Software Projects, Planning, Categories of Software projects
- Overview of Cost estimation, Uncertainty in CE, Size estimation, COCOMO Model (with example)
- SCM plans, Quality assurance plans
- Project Monitoring Plan
  - Time sheets
  - Reviews
  - Cost- schedule milestone
  - Earned value method
  - UDF
- Overview of Risk Management

Unit IV
- Introduction : System Design
- Design Objectives
- Design Principles
- Design Concepts
  - Top down and Bottom up approach
  - Problem Partition
  - Abstraction
  - Modularity
- Module Level concept, Coupling, Cohesion
- Overview of structured design, Function v/s Object Oriented approach
- Design Specification, Verification, Metrics, Monitoring & Control

Unit V
- Introduction: Detailed Design
- Module Specification, Desirable properties, functional module
specification, Data abstraction specification
- PDL, Logic/ Algorithm Design
- Verification – Design Walkthrough, Critical Design review, Consistency checkers
- Metrics (Data Binding), Monitoring & Control

Unit-VI
- Introduction: Coding, Top Down & Bottom Up approach for coding
- Structured programming Information Hiding
- Programming style, Do’s and Don’ts of good coding style, Internal documentation
- Verification (code reading), Metrics (size & complexity, style)
- Introduction: Testing, Error, Fault, Failure & reliability
- Top down and Bottom approach for Testing
- Levels of Testing
- Functional Testing & Structural testing : overview, Testing process
- Metrics (overview), monitoring & control

Main Reference Books:
1. An Integrated Approach to Software Engineering
2. Software Engineering a practitioner’s approach

Additional Reference Books

| Unit-I | - Java History, Features, comparision with C & C++  
|        | - Java and Internet, www, Java Environment  
|        | - Java Program Structure and Simple Program  
|        | - Implementing a Java Program , JVM  
|        | - Java Tokens and Comments  
|        | - Constants, Variables, Data types, Declaration of Variables, Giving values to Variables  
|        | - Scope of Variables, Type Casting  
|        | - Getting Values of Variables, Default Variables  
|        | - Operators: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional & Special operators  |
| Unit-II | - Decision Making: if Statement, The If…else statement, nesting of if…else , the else if ladder, switch statement, ?: operator  
|        | - Looping: while, do…while, for, jumps in loops  
|        | - Defining a class, adding variables, adding methods, creating objects  
|        | - Accessing class members, Constructors, methods, overloading, static members, Java Public, Private Access Level  
|        | - Defining a subclass, Subclass constructor, Overriding methods, Final Variables and methods, Abstract methods and classes, Visibility control  |
| Unit-III | - Arrays: One , Two, Multi dimensional Arrays  
|         | - Strings : String arrays, String methods, Mathematical Functions of Math class  
|         | - Interfaces: Introduction, Defining, Implementing & Accessing  
|         | - Managing Errors and Exceptions: Introduction, Types of errors, exception, Syntax of Exception Handling Code, Multiple Catch Statement, Finally, Throwing our own exceptions, throws  |
| Unit-IV | - Introduction, Concepts of Streams, Stream Classes  
|         | - Byte Stream Class  
|         | - Character Stream Class  
|         | - Using Streams, Other useful I/O classes (wrapper class)  
|         | - Using the file class, Input / Output Exceptions  
|         | - Creations of Files, Reading/Writing Characters  
|         | - Handling Primitive Data Types  |
| Unit-V | - Applet Basics: Applet Architecture, An Applet Skeleton, Simple Applet Display Method, Requesting, Repainting, Using the status Window, The HTML APPLET tag  
|         | - Introduction to awt: Control Fundamentals, Label, Button  
|         | - Applying Check Box, Check Box Group, Choice Control, List  
|         | - Using a Textfield, Using a TextArea  
|         | - The delegation event model  
<p>|         | - Event class: Action, Focus, Item, Using Delegation event model for Mouse &amp; Keyboard, Listener interface for them.  |</p>
<table>
<thead>
<tr>
<th>Unit-VI</th>
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<tbody>
<tr>
<td>- Packages: Introduction, Java API Packages, Using System Packages,</td>
</tr>
<tr>
<td>User defined packages, Creating, Accessing &amp; Using Package</td>
</tr>
<tr>
<td>- Threads: Creating, Supporting, blocking, Life Cycle, Using Thread</td>
</tr>
<tr>
<td>Methods, Thread Exception.</td>
</tr>
<tr>
<td>- Java Beans: Advantages, Application Builder tools, Introduction to</td>
</tr>
<tr>
<td>Bean Developer Tool.</td>
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</tbody>
</table>

**Reference Books:**


**Additional Reference Books:**

### Sardar Patel University

**Course: BCA – 306**  
**Operating System Concepts**

<table>
<thead>
<tr>
<th>Unit-I</th>
</tr>
</thead>
</table>
| - Introduction to Operating System, Functions of OS  
| - Introduction to jobs, files, processes, command interpreter  
| - Different types of OS: Real time, Multi-user, distributed  
| - OS Structure – Monolithic, Layered, Virtual Machine, Client-Server  

<table>
<thead>
<tr>
<th>Unit-II</th>
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</table>
| - CPU Scheduling: Introduction to Process, Process Scheduling  
| - FCFS Scheduling, SJF and Priority base scheduling, Round Robin Scheduling  

<table>
<thead>
<tr>
<th>Unit-III</th>
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</table>
| - Memory Management: Concept, Basic memory management, Swapping, Virtual Memory System, Demand Paging  
| a. The Optimal Page Replacement Algorithm  
| b. The NRU Page Replacement Algorithm  
| c. The FIFO Page Replacement Algorithm  
| d. The second change Page Replacement Algorithm  
| e. The clock Page Replacement Algorithm  

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<thead>
<tr>
<th>Unit-IV</th>
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</thead>
</table>
| - Process Synchronization, Introduction to Cooperating process  
| - Critical Section Problem  
| - Two process solution, Multiple process solution  
| - Deadlock and characterization  
| - Handling Deadlock using Bankers algo.  

<table>
<thead>
<tr>
<th>Unit-V</th>
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</thead>
</table>
| - Introduction to Linux System & History  
| - Features of Linux  
| - Introduction to File System & Memory Management  
| - Basic Commands: login, logout, date, man, pwd, who, whoami, dir, ls, cd, mkdir, rmdir  
| - Use of Wild card characters and introduction to vi editor  

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<thead>
<tr>
<th>Unit-VI</th>
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</table>
| - Introduction to environment variable like HOME, PATH, PS1  
| - Types of FAP, use of chmod command  
| - Basic commands like cp, mv, rm, rev, file redirection  
| - Grep, cut, paste, find sort commands with example  
| - Introduction to shell script: execution of it, shell script variable, expr, test commands  
| - Control structure: if, if..else, case structure  
| - Iteration: while, for construct, break, continue, exit commands  

### Reference Books:

1. Andrew S. Tanenbaum: Operating System design & Implementation, Prentice Hall International
2. James Peterson and Abraham Silberschatz: Operating System Concept, Addison Wesley
3. Linux Commands Instant reference – Bryan Pfaffenberger BPB Publication
Part I: Intrinsic Controls and VB Basic (50%)

Practical Based on following concept:
- VB Basics (Variable, Control Structures, Loops, Subroutines, Functions)
- Forms & MDI Concepts
- Intrinsic Control
- Functions (String, Numeric, Date, Formatting, Conversion)
- Array handling
- Modules
- Text file handling

Part II: Advanced Controls, Database Programming and Reporting (50%) 

Practical Based on following concept:
- Advanced controls (Unit-3 & 4)
- Database programming with ADODC & ADODB classes
- Reporting with Data reports.
Sardar Patel University  
Course: BCA – 308  
(Practical based on BCA 305)

External marks: 80  
Internal marks: 40  
Course Credit: 03  
University Examination duration: 3 hrs  
Number of Credits/Lect. per week: 06  
Total Marks: 120

Part I: Develop the program using Core Java (50%)  
Practical based on following concept:  
- Operator and Expression  
- Decision making, branching and looping  
- Classes, Object and Methods  
- Arrays and String  
- Interface and Inheritance  
- Managing error and exception

Part II: Develop the Program using Advance Java (50%)  
Practical Based on following concept:  
- Applet Programming  
- Thread (Except Multithreading)
Sardar Patel University
Course: BCA – 309
(In-house project and practical based on BCA-303 & BCA-306)

External marks: 80                     Internal marks: 40
Course Credit: 03          University Examination duration: 3 hrs
Number of Credits/Lect. per week: 06            Total marks: 120

Part I: (A)  Flash Animation (25%)  
Practical based on following concept:
  • Simple animation
  • Shape Tweening
  • Motion Tweening

(B)  Shell Scripting (25%):
Practical based on following concept:
  • Simple shell scripting based on the Linux commands
  • Simple programs using the Control Structures & Iterations

Part II:  In-House Project Development (50%)

Projects Like:

1. Payroll System for College
2. Library Management System
3. On-Line Shopping
5. Attendance System for the college
6. Student Information System for the College
7. Insurance System
8. Hotel Management System
9. On-Line Quiz System
10. System for private clinic
11. WAP Site for College
12. Billing System for Electricity Board
13. Billing System for Telephone Exchange
14. Students Admission System for SCA
15. Admission System for College
16. Hostel Management System
17. MP3 to wave convertor
18. Text to voice convertor
19. Voice chatting
20. Voice to text convertor
21. Chart Maker (Generate different types of charts according to given data )
22. Installation or Copying utility
23. Subject tutor
24. Grapher (Generate from a given equation)
25. Mail Server System
26. Time Scheduling System
27. Bank A/C Allocation and Customer Information System
28. Railway Inquiry System
29. Library Management / Information System
30. Stores Sales Management System
31. Faculty and Students Attendance System

**309- TYBCA PROJECT**

**Guidelines**

a) Project work would be done in College only.
b) The project can be scientific, commercial, meeting needs of big organizations or college or it can be of system side. It can be case study of big organization. However topics related to college automation may be given higher priority. The students are supposed to visit the organization only after regular teaching hours of the college for the project work.
c) The problem definition can be form outside also and in this case the work is to be done in college. Preference is give to the project definition having utility. Problem definition must be within Indian Geographical Boundary.
d) One to two students may be allotted per project.
e) Duplication of projects should be avoided in the same year.
f) Minimum 100 hour machine time must be provided to each student and additional 100 hours are to be used for analysis, design, documentation and for preparation of data / entry. Test records are to be entered by the students. The cost of collecting information from outside and preparing input records is to be borne by the students.
g) Regular BACKUP of project work is to be taken

h) Each Student should be assigned to one computer science teacher, who would be known as his supervisor of the project. Preferably all teachers should be associated to act as supervisors to avoid overburdening on one individual.
i) The project work is to be done by the student regularly. The student should prepare timesheet for the time devoted in different activities of projects like analysis, design, coding, testing. Supervisors should monitor the progress of each student periodically, preferably weekly or fortnightly.
j) One of the lecturers should be appointed as Project Coordinator.
k) Two meetings (one per term) should be arranged to evaluate the students for project work through presentation and award the internal marks. For this board of examiners (for internals) should be formed.
l) The college is recommended to have the following hardware and software, specially earmarked for use of students for the smooth functioning of project work.

**HARDWARE**

1. Scanner
2. Laser Printer (to be used to print one copy of the project at the end)
3. Digital Camera
4. Multimedia System
5. Backup Systems
6. UNIX System
7. IIS Server
8. Mail Server
9. Internet
10. VCP / VCR
11. Audio cassette player