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:
1. Management Information System : by T. Lucey, 8th Edition BPB Publication
2. Organizational & Management : By Agarwal, Tata McGraw Hill Publishing Company Ltd.
3. MIS – By W.S. Jawadekar, Tata McGraw Hill Publishing Company Ltd.

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

Unit-I	**Visual Programming**
	- Introduction, Its Features, Introduction to Project types
	- Development Environment: Menubar, Toolbars, Project Explorer, Toolbox, Properties Window, Form Designer, Form Layout, Immediate Window
	- Datatypes, Variables: Declarations, Conversion, Forcing Declaration, Scope, lifetime, Special values
	- Control Structures: If and select case structure
	- Looping structures : While, Do while, For…Next, Do…Loop until
	- Displaying Message- Messagebox and Inputbox, Subroutines and functions with examples
Unit-II	**Designing user Interface**
	- Forms and MDI Form
	- Intrinsic Controls: Pointer, Picturebox, Imagebox, Textbox, Label, Frame, Command button, Radio Button, Checkbox, Combobox, Listbox, Horizontal & Vertical scrollbars, Timer, Shape, Line, DriveList, Directory List, File List Box,. Properties, events and methods, Aligning and sizing controls, Menu editor.
	- Functions : String: len, mid, ucase, lcase, str, val, strconv, isnull, empty
	- Numeric: cstr, isnumeric
	- Data & Time : date, time, now, cdate
	- Sample application
Unit-III	- Arrays: Declaration and use of one, two or multi-dimensional arrays, Dynamic Arrays
	- Modules: Creating and using
	- Handling Text files: Opening, Closing, Reading and Writing in Random mode
	- Advance controls: Toolbar, Imagelist, Statusbar, Progressbar, Dialogbox, Tab, Treeview, Listview, Slider, Datepicker, Richtextbox, Monthview, Maskedit.
	- Sample applications on advance controls
Unit-IV	**Connecting to Databases**
	- Introduction to DAO and RDO
	- Data Control: Properties & Methods
	- The ADO Control:
	- Programming Active Data Objects, Establishing connections, Executing SQL Statements
	- Manipulating recordset objects
	- Data Bound controls : Datagrid, Flexgrid, Data Bound ListBox and Combobox
	- Error Handling and Debugging, Types of Errors, Error Debugging, Debug Object & The Err Object
	- Sample Applications on database connections
Unit-V	**Data Reports**
	- Setting up data environment, connection, command
	- Building reports in designer, building interface to reports

	- Grouping & passing parameters, Testing & running reports - Creating ActiveX controls & registering - User defined datatypes, properties and events - Package & deployment of application
Unit-VI	**Introduction to ASP:** - Client server interaction, Building parameter strings, contacting web server & server application - Active Server Pages, creating pages, included files - Use of Active Server Objects - Intrinsic Objects, Basic objects, Response, Request, Server, Start & End Events - Setting ODBC data source using ActiveX data objects

Reference Books:
1. Mastering Visual Basic 6- Evangelos Petroutsos BPB Publication
2. The Complete Reference Visual Basic 6 – Noel Jerke Tata McGraw Hill

Additional References:
1. Visual Basic 6 Programming Black Book – Steven Holzner Dreamtech Press
2. How to program Visual basic 6- Deital & Deital Pearson Education

Sardar Patel University
Course: BCA – 303
Computer Graphics & Multimedia Applications

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

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. - Hardcopy 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

Unit-V	- Multimedia Text: Designing Text for Multimedia, Hypermedia, Hypertext - Multimedia Graphics: Graphics in Multimedia Project, Source of image, Hypergraphics - Multimedia Animation: Introduction & Classification - Two- dimensional animation & Three dimensional animation Technology - Names of animation software tools
Unit-VI	- Two dimensional animation - Drawing and painting, Tools, transforming objects - Importing graphics - Advance drawing techniques - Animation - Motion tween and shape tween - Using Timeline effects - Using Layers

Reference Books:

1. Computer Graphics by Donald Hearn & M. Pauline Baker, PHI, 1995
2. Multimedia Magic. By S. Gokul, BPB Publications, 1998.
3. Macromedia Flash MX 2004 in 24 hours by Phyllip Kerman, Pearson Education

Sardar Patel University
Course: BCA – 304
Software Engineering

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

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**
   By Pankaj Jalote, Narosa Publishing House, Second Edition,1997
2. Software Engineering a practitioner's approach
   By Roger S. Pressman, Tata McGraw- Hill, 5th Edition

Additional Reference Books

1. Software Engineering Fundamentals, By Richard Fairley, Tata McGraw Hill
2. Software Engineering By Ian Somnmerville, Addition- Wesley, 5th Edition, 2000

Sardar Patel University
Course: BCA – 305
Object Oriented Programming Using JAVA

External marks: 80   **Internal marks: 40**

Course Credit: 03   **University Examination duration: 3 hrs**

Number of Credits/Lect. per week: 03

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 - Event class: Action, Focus, Item, Using Delegation event model for Mouse & Keyboard, Listener interface for them.

Unit-VI	- Packages: Introduction, Java API Packages, Using System Packages, User defined packages, Creating, Accessing & Using Package - Threads: Creating, Supporting, blocking, Life Cycle, Using Thread Methods, Thread Exception. - Java Beans: Advantages, Application Builder tools, Introduction to Bean Developer Tool.

Reference Books:

1. Programming with Java- A Primer by E. Balaguruswami, 2nd Edition, TMH Publication
2. The Complete Referecne – Java 2 4th Edition Herbert Schildt. TMH Publication

Additional Reference Books:

1. Saba Zame , Handbook of Object technology, CRC Press, Washington DC, 1999
2. Mary Campion and Kathy Walrath, Java tutorial, Second Edition, Addison Wesley Pun. 1998

Sardar Patel University
Course: BCA – 306
Operating System Concepts

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 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
Unit-II	- CPU Scheduling: Introduction to Process, Process Scheduling - FCFS Scheduling, SJF and Priority base scheduling, Round Robin Scheduling

Unit-III	- 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

Unit-IV	- Process Synchronization, Introduction to Cooperating process - Critical Section Problem - Two process solution, Multiple process solution - Deadlock and characterization - Handling Deadlock using Bankers algo.
Unit-V	- 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
Unit-VI	- 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 deign & Implementation, Prentice Hall International
2. James Peterson and Abraham Silberschatz: Operating System Concept, Addition Wesley
3. Linux Commands Instant reference – Bryan Pfaffenberger BPB Publication
4. Advanced Linux Programming – Samuel, Techmedia Publications

Course: BCA – 307
(Practical Based on BCA 302)

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: 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.

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
4. Billing System for Grocery shop, book stall
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 Schedulling 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