

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-301 : Data Structures using C++
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	<p>Fundamentals of Programming</p> <ul style="list-style-type: none"> - Concept of Procedural, structured and object oriented programming - Concept of Encapsulation, Data Hiding, Inheritance and Polymorphism - History of C++ and its object oriented programming techniques - Classes and Objects - Advantages of object-oriented programming over procedural languages, Parts of C++ program - Data Types, Variables, Constants, expression and statements for formatted I/O, Usage of header files using INCLUDE statement
Unit-II	<p>Control Statements, Arrays, Structures and Classes</p> <ul style="list-style-type: none"> - Looping : while, Do...While, For loop, Continue and break statement, Switch statement, IF statement, IF..ELSE statement - Array : Initializing one dimensional and two dimensional, Multi dimensional array, Passing arrays to functions, Array Classes - Structures and Enumerated Data types: Declaration of structure, initialization of structure, Array of structure and pointers to structure, structure within structures, Enumerated Data types - Classes : Creating new type of class, Classes and members, Accessing class members, Implementing class methods, Constructors and Destructors, Private and public class.
Unit-III	<p>Functions and Pointers</p> <ul style="list-style-type: none"> - Function Definition <ul style="list-style-type: none"> - Declaring and defining function, passing of parameters, passing structure variables as argument, passing address (passing by reference), Function with arguments, Overloading function, Inline Function, Storage classes and Static Storage Classes - Pointer <ul style="list-style-type: none"> - Concept of a pointer variable and its declaration, Pointer arithmetic, manipulating data by sing pointers, Pointers in string handling, Pointer to pointer, Arrays of pointers, Pointers and array names, Dynamic memory allocations, Pointers to objects.
Unit-IV	<p>Primitive Data Structures, Array & Stack</p> <ul style="list-style-type: none"> - Fundamental Notations <ul style="list-style-type: none"> - Primitive & Composite data types - Operations on data structures, number systems - Storage representation of integer, real numbers character strings - Array & Stack <ul style="list-style-type: none"> - Storage structure for arrays - Definition of stacks, operations on stacks (PUSH, POP, PEEP, CHANGE) - Application of Stack <ul style="list-style-type: none"> - Recursion(Factorial)

	<ul style="list-style-type: none"> - Polish Notation - Conversion of infix expression to polish notation - Conversion of polish notation to code
Unit-V	Queues & List <ul style="list-style-type: none"> - Queues - Operation on queue (insert, delete) - Circular queue (insert, delete) - Dqueue (insert, delete) - Application of queue (Simulation) - Linked List - Linked list (insert, delete & storage representation) - Single Linked List - Circular Linked List
Unit-VI	Trees and Graphs <ul style="list-style-type: none"> - Trees <ul style="list-style-type: none"> - Definition of Tree, a directed Tree, m-ray-tree, binary tree - Operations on binary tree (Traversal of tree, insertion, deletion, searching, copying) - Methods of representing tree - Ordered tree, construction of a binary tree - Lexically Ordered tree & rules to construct it - Storage representation of binary tree (Linear & Linked) - Threaded representation of binary tree - Graph <ul style="list-style-type: none"> - Definition: Adjust node, Directed graph, Undirected graph, Mixed graph, Loop, Parellel Edges, Multigraph, Simple graph, weighted graph, isolated node, null graph, path, cycle, Acyclic, Indegree, Outdegree, Graph traversal

Books:

1. Object Oriented Programming and C++ by Rajaraman
2. Object Oriented Programming with C++ by E. Balagurusamy
3. Bhagat Singh & Thomas L Naps: Introduction to Data Structures

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-302 : Management Information System
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	Introduction to MIS <ul style="list-style-type: none"> - What is MIS - What is Management - What is Information - What is System - Why we need MIS - Functions of MIS - Problems & Knowledge requirements (7 areas) - Applications of MIS - HR Systems - Purchase Sales and Inventory - Introduction to Service Sectors - Source of Information collection
Unit-II	Management Skill and MIS approach <ul style="list-style-type: none"> - Management and organizational behavior - Management, information and the system approach - What the manager should know about the computer system - Data processing and the computer - Operation of a Manual Information system - Components of a computer system - Conversion of manual to Computer based system
Unit-III	MIS-Planning & Planning terms <ul style="list-style-type: none"> - Planning & Planning terms - Objectives - Problems - Types & Sources of planning information - MIS planning: Details - Time Management
Unit-IV	Data Processing <ul style="list-style-type: none"> - Data Cycle - Types of Processing - Overview of Batch Data Processing, On-Line Data Processing, Real time Data Processing - IT & MIS - What is IT? - Are computer essential for MIS - Office Support System (Whole)
Unit-V	Computer Center Management & DSS <ul style="list-style-type: none"> - Role of Computer Center Personnel - Structure of IT Department - EDP Control & audit - Introduction to CISA - Introduction to DSS

	<ul style="list-style-type: none"> - Decision Making Process Review - Group Decision Making - Data, Model & Dialogue
Unit-VI	Elements of Control <ul style="list-style-type: none"> - Concepts of Controlling Management - Control Cycle - Different feedback loops - Principles of Controlling - Multiple Control Factors - Scope of Management Control - Total Quality Control & Management

Books:

1. Information Systems for Modern Management by Robert J. Murdick, Joel E. Ross & James R. Clagget
2. Management Information Systems by Lucey T.
3. Organization and Management by Agarwal R.D
4. Business Information Systems By Maneesh Kumar.

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-303 :Database Management System
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	Introduction to DBMS <ul style="list-style-type: none"> - Basic concepts - File Processing concepts - Problem with early information system - Organization of database - Components of DBMS - Advantages & disadvantages of Database - Introduction to Data Models - ER Model
Unit-II	Logical & Physical Data Models <ul style="list-style-type: none"> - Hierarchical model : Concept, Example, advantages & disadvantages - Network model : Concept, Example, advantages & disadvantages - Relational model : Concept, Example, advantages & disadvantages - Conversion of ER model to RDM - Relational Algebra
Unit-III	Introduction to Database design & Database Administration & ER Models <ul style="list-style-type: none"> - Normalization – First, Second and third Normal forms - Database security - Database recovery methods - Introduction to DDBMS
Unit-IV	Introduction to SQL <ul style="list-style-type: none"> - Fundamentals of RDBMS, normalization, CODD's Principles - Introduction to SQL syntax - Creation, updation and access of relation tables using SQL - Command: Create, insert, update, delete, select, alter, drop - Data constraints : column level, table level, Null value, primary key, unique key, foreign key - Check Integrity Constraints - Range Searching Pattern Matching - Oracle Functions: AVG, MIN, COUNT, MAX, SUM, ABS, POWER, ROUND, SQRT, LOWER, INITCAP, UPPPER, SUBSTR, RPAD, LENGTH, LPAD, LTRIM, RTRIM, LENGTH, TO_NUMBER, TO_DATE, TO_CHAR
Unit-V	Structured Query Language <ul style="list-style-type: none"> - Group of data, data manipulation, joining multiple table, joining a table to itself - Subqueries: Union, Intersect, Minus Clause - Indexes : Create, Drop - Views : Create, Update, Destroy - Sequences: Create, Alter, Drop - Granting and Revoking Permissions - Introduction to PLSQL

	<ul style="list-style-type: none"> - Iterative Control: While, For, GOTO - Oracle transactions, LOCKS - CURSORS: Opening, closing, %NOTFOUND, %FOUND, %ISOPEN, %ROWCOUNT - STORED procedures, STORED functions - Database Triggers: Creating , Deleting
Unit-VI	TOOL <ul style="list-style-type: none"> - Creating, Generating , running forms - Forms Hierarchy like : PROPERTY CLASS, VISUAL ATTRIBUTES, BLOCKS, CANVAS & Multiple CANVASES, LOVs, Parameter Passing in FORMS, Master Detail Form. - TRIGGERS: WHEN_BUTTON_PRESSED, WHEN_VALIDATE_ITEM, WHEN_MOUSE_CLICK, WHEN_MOUSE_DOUBLECLICK, WHEN_MOUSE_ENTER, WHEN_MOUSE_LEAVE, KEY_NEXT_ITEM, KEY_PREV_ITEM, KEY_NXTBLK, KEY_PRVBLK - Creating, Generating and Running Reports - Data Model: Queries, Groups, Columns, Parameters, Data Links, Layout - Report Style - Tabular, Master/Detail Form, Form Letter, <ailing Label, Matrix - Creating a Control Break Report

Books

1. Introduction to database system By Desai Bipin C.
2. ORACLE Developer 2000 by Ivan Bayross
3. Database technology a Software Engineering Approach by Hughes John. G.
4. Fundamentals of Database System Elnagri R. Nvathe S. B

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-304 : System Analysis & Design
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	Structured System Analysis and Design Method – (SSADM) <ul style="list-style-type: none"> - Need of SAD (Structured Analysis and Design) - What is SSADM? - SSADM Methodology - Advantages of SSADM - System Design control
Unit-II	Tools for determining System Analysis <ul style="list-style-type: none"> - What is Requirement? - Fact Finding Techniques : Interviewing, Questionnaires, Record Inspection, Observation - Tools for document, procedure and decisions - Decision Tables, Decision Trees and Structured English
Unit-III	Prototype Development Strategy <ul style="list-style-type: none"> - Purpose, Uses and Applications - Steps in Prototype Method - Use of Prototype - Tools of Prototype
Unit-IV	Computer Assisted Systems Engineering (CASE) Tools <ul style="list-style-type: none"> - What is CASE? - CASE Components - Benefits of CASE - Limitations of CASE
Unit-V	System Engineering <ul style="list-style-type: none"> - Types of files - Basic File Terminology - Methods of File Organization - Backup and recovery of Files - Design Objectives - Program Structure Chart - System Design - Software Design and Documentation Tools
Unit-VI	Quality Assurance <ul style="list-style-type: none"> - Levels of Assurance - Testing strategies - Level of Testing - Special System Test - Design Test Data

Books:

1. Analysis & Design of Information Systems by James A. Senn
2. Information System Analysis & Design By Ram Bansal
3. System Analysis & Design by S. Parthasarthy & B. W. Khalkar

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-305 : Project Management
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	Concept of Project Management <ul style="list-style-type: none"> - Concept of Project - Characteristics of Project - Categories of Project - Project Life Cycle Phases - Project Management Concepts - Tools and Techniques for Project Management - The Project Manage
Unit-II	Establishing the Project <ul style="list-style-type: none"> - Feasibility report - Financing arrangement - Fixing the Zero Date - Overview of - Preperation of Cost estimates - Finalization of Project Implementation Schedule - Evaluation of the Project Profitability - Organizing Human resources - Contracting
Unit-III	Organizing System & Procedures for Project Implementation <ul style="list-style-type: none"> - Working of System - Designing of System - Project work system design - Work break down structure - Project execution plan - Project Procedure manual (Overview) - Project Control System - Overview of planning, Scheduling & monitoring - Monitoring Contracts - Project diary
Unit-IV	Project Direction, Coordinating, Control and Performance <ul style="list-style-type: none"> - Project Direction - Communication in a project - Project Coordination - Project Control - Performance Control - Cost Control - Performance Indicator - The CM & DM companies for better project management - Project Management Environment
Unit-V	Introduction to PERT-CPM <ul style="list-style-type: none"> - Basic concepts and Terminology - Application of Pert/ CPM techniques - Basic steps of Pert/ CPM techniques

	<ul style="list-style-type: none"> - Identification of activities, time for activities and dependency among the activities for the project - Rules for drawing Network diagram - Network Diagram representation
Unit-VI	Project Scheduling by PERT-CPM <ul style="list-style-type: none"> - Critical Path Calculations - Determination of the Critical Path - Determination of the Floats - Construction of the Time Chart & Resource Leveling - Cost Consideration in Project Scheduling - Project Control

Books:

1. Project Management By S. Choudhary
2. Project Management by Harvey Maylor
3. Projects :Planning, Analysis, Financing, Implementation, and review by Prasanna Chandra

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-306 : Information Network
Effective from June – 2003

Number of Credits/Lect. per week: 03
University Examination duration: 3 hrs
Course Credit: 03

External marks: 80
Internal marks : 40
Total Marks :120

Unit-I	Transmission Techniques <ul style="list-style-type: none"> - Multiplexing techniques - Frequency Division Multiplexing (FDM) - Wave Division Multiplexing (WDM) - Time Division Multiplexing (TDM) <ul style="list-style-type: none"> - Asynchronous Time Division Multiplexing (Concentrator) - Synchronous Time Division Multiplexing - Switches <ul style="list-style-type: none"> - Cross band Switches - Space division switches - Time Division switches - Hub(Active, Passive, Intelligent hub) - Comparision between Hub & Switch
Unit-II	Modulating & Encoding <ul style="list-style-type: none"> - Digital to Digital (Unipolar, Polar, Bipolar) - Analog to Digital (PAM, PCM, Sampling Rate) - Digital to Analog <ul style="list-style-type: none"> - ASK, FSK, PSK, QAM, QPSK - Bit-rate, Baud rate, Modulation rate - Analog to Analog <ul style="list-style-type: none"> - Amplitude Modulation - Phase Modulation - Frequency Modulation - Types of Modem <ul style="list-style-type: none"> - V.22 bis, V.32 bis, V.32 terbo, V.33, V.34, V.42 - Intelligent Modem (Smart Modem) - Null Modem - Cable Modem
Unit-III	Network Architecture <ul style="list-style-type: none"> - Protocol Hierarchy - Layer, Protocol, Protocol Stack, Interface, Network Architecture, peer-to-peer process - Relation between protocol & service - TCP/IP model(Overview)
Unit-IV	Communication Protocols <ul style="list-style-type: none"> - What is Protocol? - Need of Protocols - SDLC and HDLC - LAN protocols & standards <ul style="list-style-type: none"> - LLC and MAC (802.2) - CSMA/CD(Ethernet)(802.3) - 1-persistent, non-persistent, p-persistent - Token bus (802.4)

	<ul style="list-style-type: none"> - Token Ring (802.5) - DQDB (802.6)
Unit-V	<p>Network Interconnecting Devices</p> <ul style="list-style-type: none"> - Repeater - Bridge <ul style="list-style-type: none"> - Types of bridge (simple, multi-port, transparent) - Spanning tree algorithm - Source Routing - Router <ul style="list-style-type: none"> - Routing Concept - Adaptive – non adaptive routing - Multi-port router - Brouter <ul style="list-style-type: none"> - routing Algorithm (Distance Vector Routing, Link State Routing) - Gateway - Network Interface Card - The TCP service model - The TCP protocol - The TCP segment header
Unit-VI	<p>Internet & Intranet</p> <ul style="list-style-type: none"> - The Internet <ul style="list-style-type: none"> - Internet, Intranet, Extranet - Internet connection option - Internet security <ul style="list-style-type: none"> - Encryption / Decryption - Firewall - Brief introduction to WWW – World Wide Web (Web-server, DNS,URL) - Examples of Internet Protocols - IP(Internet Protocol) - TCP (Transmission Control Protocol) - HTTP - SNMP(Simple Network Management protocol) - SMTP

Books:

1. Computer Networks by A. S. Tanenbaum
2. Data Communication and Networking By Behrouz A. Forouzan
3. Data Communication by William Stalling
4. Local Area Network by S. K. Basandra

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-307 : Practical Based on IS-301 and IS-302
Effective from June – 2003

External marks: 80
Internal marks : 40
Total Marks :120

Based on IS – 301(70%)

- Use of Object oriented Language for solving the problems related to
 - Pattern Generation
 - Mathematical Problem
 - String Manipulation
 - Statistical problems etc

- Programs on class, inheritance and polymorphism

- Programs to simulate various data structures like Array, Stack, Queue, Linked Lists, Trees etc

Based on IS – 302(30%)

- Case studies of various applications based on the concept of MIS & DSS.

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-308 : Practical Based on IS-303 and IS-304
Effective from June – 2003

External marks: 80
Internal marks : 40
Total Marks :120

Based on IS – 303(60%)

■ **Using SQL and PL/SQL:**

- Creation & maintenance of tables
- Retrieval of required data using SQL
- Control Break
- Preparation of Reports in various format

■ **Using Tools**

- Creation of different forms and triggers
- Creation of reports like tabular, master/detail, form letter, mailing labels, matrix

Based on IS – 304(40%)

■ **PROJECT**

- Detailed documentation containing System Analysis & System Design
- Implementation (Coding)

Sardar Patel University
T.Y.B.Sc (Information Science)
IS-309 : Practical Based on IS-305 and IS-306
Effective from June – 2003

External marks: 80
Internal marks : 40
Total Marks :120

Based on IS – 305(20%)

- Study of various small projects undertaken by nearby organization and preparing reports
- For a given Project
 - Identification of Activities
 - Determining the Time for Activities
 - Determining the dependency among activities
 - Preparation of Network Diagram

Based on IS – 306(50%)

- Case Studies of LAN setup in nearby organization and preparation of Report containing the following information:
 - Organization Profile
 - Application Supported
 - Transmission Media
 - Total number of nodes & their physical locations
 - Topology
 - Server/workstation hardware configuration
 - Other LAN components to be used with their physical locations
 - Network Operating System and their software needed.
- Design & Implementation of LAN using various NOS like NOVELL, Linux, Windows NT.
- Introduction to HTML, VB Script and ASP

PROJECT(30%)

- Designing a simple interactive website.