

CS - 301 SYSTEM ANALYSIS AND DESIGN

External Marks: 60 L T P Internal Marks: 40 3 1 Total Marks: 100

PREREQUISTES: None

OBJECTIVES:

The course has been designed to provide a solid foundation of systems principles and an understanding of how business function, while heightening students to the issues analysts face daily.

COURSE CONTENTS:

1.Introduction [L-2]

System definition and concepts: Characteristics and types of system, Manual and automated systems

Real-life Business sub-systems: Production, Marketing, Personal, Material, Finance

Systems models types of models: Systems environment and boundaries, Realtime and distributed systems, Basic principles of successful systems

2. Systems analyst [L-1]

Role and need of systems analyst ,Qualifications and responsibilities ,Systems Analyst as and agent of change,

3. System Development cycle [L-3]

Introduction to systems development life cycle (SDLC) :

Various phases of development :Analysis, Design, Development,
Implementation, Maintenance

Systems documentation considerations: Principles of systems documentation , Types of documentation and their importance,Enforcing documentation discipline in an organization .

4. System Planning [L-5]

Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits.

Feasibility study and its importance

Types of feasibility reports

System

Selection plan and proposal

Prototyping

Cost-Benefit and analysis: Tools and techniques

5. Systems Design and modeling [L-8]

Process modeling, Logical and physical design, Design representation, Systems flowcharts and structured charts , Data flow diagrams , Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis , Designing the internals: Program and Process design ,Designing Distributed Systems .

6. Input and Output [L-2]

Classification of forms: Input/output forms design, User-interface design, Graphical interfaces

7. Modular and structured design [L-5]

Module specifications ,Module coupling and cohesion , Top-down and bottom-up design .

8. System Implementation and Maintenance [L-2]

Planning considerations, Conversion methods, producers and controls, System acceptance Criteria, System evaluation and performance, Testing and validation, Systems qualify Control and assurance, Maintenance activities and issues.

9. System Audit and Security [L-2]

Computer system as an expensive resource:

Data and Strong media

Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails,

Types of threats to computer system and control measures: Threat to computer system and control measures, Disaster recovery and contingency planning

10. Object Oriented Analysis and design [L-6] Introduction to Object Oriented Analysis and design life cycle, object modeling: Class Diagrams, Dynamic modeling: state diagram, Dynamic modeling: sequence diagramming.

11. Case study of the following systems [L-5]

(I) Inventory Control

(II) Railway Reservation System

(III) University Management System

(IV) Hospital management System

TEXTS BOOKS

1. System analysis and design - Elias M.Awad.

REFERENCES

1. System analysis and design –Perry Edwards
2. Analysis and design of information systems – James A.Senn

CS-303 COMPUTER NETWORKS

External Marks: 60 L T P Internal Marks: 40 3 1 Total Marks: 100

I)INTRODUCTION: Basic concepts of analog and digital signals, data transmission concepts, Analog and digital data transmission, transmission impairments. (L-6)

II)TRANSMISSION MEDIA: Guided and Un-guided media, Performance, Shannon Capacity. Media Computerisation. (L-5)

III)ENCODING AND MODULATING : Digital-to-Digital conversion, Analog and digital conversion, Digital to Analog conversion, Analog to Analog conversion. (L-6)

IV)DIGITAL DATA COMMUNICATION: Digital data transmission, DTE – DCE Interface, EIA-449, EIA-530, X.21, Modems, Cable Modems. (L-6)

V)MULTIPLEXING AND SWITCHING: FDM, WDM, TDM, Multiplexing application – telephone systems, DSL, Par Circuit switching Packet Switching & Message switching virtual circuits. (L-6)

VI) SPREAD SPECTRUM: Concept, Frequency hopping spread spectrum, direct sequence spread spectrum, code-division Multiple Access. (L-4)

VII) ERROR DETECTION AND CORRECTION: Types of Errors, Detection, VRC, LRC, CRC, Checksum, Error Correction.

(L-4)VIII) PROTOCOL ARCHITECTURE:

Protocols, standards, OSI, TCP/IP Protocol Architecture. (L-5)

Text Books :

1. “Data Communications and Networking” – Behrouz A Ferouzan – nd Edition, TATA McGraw Hill.
2. “Data and Computer Communication” – th William Stallings, Pearson Education.

References:

1. “Data Communication and Distributed Networks” – Ulylers D rd Edition, PHI.
2. “Computer Networks” – Andrew S. Tanenbaum, PHI

CS– 305 DATABASE MANAGEMENT SYSTEMS External Marks: 60 L
T P Internal Marks: 40 3 1 Total Marks: 100

PREREQUISITES: Data Structure

OBJECTIVES : To learn how to use a DBMS and how to build a DBMS.

COURSE CONTENTS:

Part – 1 Basic Concepts

Databases And Database Users: Introduction, Characteristics of Database Approach, Advantages And Disadvantages of Using DBMS. (L-2)

Database System Concepts And Architecture:Data Models, Schemas And Instances, DBMS Architecture And Data Independence, Database Language And Interfaces, Classification of Database Management Systems. (L-3)

Data Modeling Using The Entity Relationship Model:Entity Types, Entity Sets, Attributes And Keys, Relationships, Relationship Types, Roles, And Structural Constrains, Weak Entity Types, ER Diagrams, Naming Conventions And Design Issues. (L-4)

Part – 2 Relational Model, Language And Systems

The Relational Data Model, Relational Constrains, The Relational Algebra and Relational Calculus:Relational Model Concepts, Relational Constraints And Relational Database Schema, Update Operations And Dealing With Constraint Violations, Basic Relational Algebra Operations, Example of Queries in Relational Algebra, The Tuple Relational Calculus, The Domain Relational Calculus. (L-6)

SQL Relational Database Standard:Basic queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Views in SQL, Additional Features of SQL. (L-6)

Part – 3 Database Design Theory and Methodology Functional Dependencies and Normalization for Relational Databases: Informal Design Guidelines for Relation Schemas, Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms.

(L-4)

Part – 4 System Implementation Techniques

Transaction Processing Concepts: Introduction to Transaction Processing, Transaction and System Concepts, Desirable Properties of Transactions, Schedules and Recoverability, Serializability of Schedules.

(L-3)

Concurrency Control Techniques: Locking Techniques for Concurrency Control, Concurrency Control Based on Timestamp Ordering, Validation Concurrency Control Techniques, Granularity of Data Items and Multiple Granularity Locking. (L-3)

Database Recovery Techniques: Recovery Concepts, Recovery Techniques Based on Deferred Update, Recovery Techniques Based on Immediate Update, Shadow Paging.

(L-4)

Database Security and Authorization: Introduction to Database Security Issues, Discretionary Access Control Based on Granting/Revoking of Privileges, Introduction to Statistical Database Security. (L 3)

Text Books : 1. Fundamentals of Database Systems, Third Edition, by Elmasri/Navathe 2. Korth and Silberschatz Abraham, Database Concepts, McGraw Hall, 1991 3. An introduction to Database Systems by C.J.Date.

References :

1. An introduction to Database Systems by Bipin C. Desai.
2. SQL, PL/SQL, The programming language of oracle, Ivan Bayross BPB Publication.

**CS - 307 DESIGN AND ANALYSIS OF
ALGORITHMS**

**External Marks: 60 L T P Internal Marks: 40 3 1 Total
Marks: 100**

PREREQUISITES: Discrete Structures and Data Structures.

OBJECTIVES:

Date Structures are an integral part of algorithm design and Discrete Structures covers topics like graph theory.

COURSE CONTENTS:

Models of computation. Algorithm analysis, order arithmetic, time and space complexities and average and worst case analysis, lower bounds. [L -8]

Algorithm design techniques: divide and conquer, search and traversals. Dynamic programming. Backtracking. Branch and bound. [L-16]

Sorting and searching algorithms, combinatorial algorithms, string processing algorithms. Algebraic algorithms, set algorithms. Hard problems and approximation algorithms. [L 12]

Problem classes P, NP, NP-hard and NP-complete, deterministic and non deterministic polynomial time algorithms., Approximation algorithms for some NP -complete problems.

[L-6]

TEXT BOOKS

1.V. Aho, J.E.Hopcroft, J.D. Ullman, design and Analysis of Algorithms, Addison Wesley, 1976. 2.Horowitz, S. Sahni, Fundamentals of Computer Algorithms, Galgotia P ublishers, 1984. **REFERENCES:** 1. D.E.Knuth, The Art of Computer Programming, Vols. 1 and 3, Addison Wesley, 1968,1975. 2. K.Mehlhorn, Data Structures and Algorithms, Vols. 1 and 2, Springer Verlag, 1984. 3. Purdom, Jr.and C. A. Brown, The Analyses of Algorithms, Holt Rinechart and Winston, 1985.

CS - 309 COMPUTER GRAPHICS

**External Marks: 60 L T P Internal Marks: 40 3 1 Total
Marks: 100**

PREREQUISITES: Data Structures and Algorithms.

OBJECTIVES:

Understanding the fundamental graphical operations and the implementation on computer, Get a glimpse of recent advances in computer graphics, Understanding user interface issues that make the computer easy for the novice to use.

COURSE CONTENTS:

Introduction: What is Computer Graphics, Elements of a Graphics, Workstation, Graphics hardware, I/o devices, Display devices [L-4]

Basic Raster Graphics: Scan conversion [L-4]

Filling [L-2]

Clipping. [L-2]

Geometric Manipulation: Transformations [L-4]

Matrices, Homogeneous Co-ordinates. [L-6]

Elementary 3D Graphics: Plane projections, Vanishing points, Specification of a 3D view.

[L-6]

Visibility: Image and object precision, z- buffer algorithms, area based algorithms, floating horizon. [L-6]

Advanced Issues: [L-4]

- A. Curves and surfaces: Parametric Representation, Bezier and B -Spline curves.
- B. Rendering, raytracing, antialiasing, fractals, Gourard and Phong shading.

TEXT BOOKS:

1. Computer Graphics (Schaum Series) by Lipschutz (MC Graw Hill)
2. Hearn and P. Baker. Computer Graphics, Prentice Hall.
3. C.Graphics by Yashwant Kanetkar.

REFERENCES:

1. D.Rogers and J. Adams, Mathematical Elements for Computer Graphics, McGraw -Hill International Edition.
2. David F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill Book Company.
3. Alan Watt and Mark Watt, Advanced Animation and Rendering Techniques, Addison-Wesley.
4. Young, X Window. System Programming, OSF/Motif Edition, Prentice Hall.

CS-311 COMPUTER PERIPHERALS AND INTERFACES

External Marks: 60 L T P Internal Marks: 40 3 1 Total Marks: 100

PREREQUISITES: Microprocessor and Assembly Language Programming.

OBJECTIVES:

To learn the functional details of various peripheral devices.

COURSE CONTENTS: SYSTEM RESOURCES: Interrupt, DMA Channel, I/O Port Addresses and resolving and resolving the conflict of resources. I/O buses- ISA, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.

(L-10)**IDE & SCSI Interfaces:** IDE origin, IDE Interface ATA standards ATA1 to ATA7. ATA feature, ATA RAID and SCSI RAID, SCSI Cable and pin Connector pin outs SCSI V/s IDE Advantages and limitation.

(L-4)**Video Hardware :** Video display technologies, DVI Digital signals for CRT Monitor, LCD Panels, Video adapter types, Integrated Video/ Motherboard chipset, Video RAM, Video driver and multiple Monitor, Graphic accelerators. Advanced 3D Technologies, TV Tuner and Video Capture upgrades troubleshooting Video Cards and Drivers.

(L-8)**I/O Interfaces:** I/O Interfaces from USB and IEEE1394, I/O Interface from serial and Parallel to IEEE1394 and USB 961, Parallel to SCSI converter. Testing of serial and parallel port, USB Mouse/ Keyboard Interfaces.

(L-10)**Input/ Output Driver software aspects:** Role of device driver DOS and UNIX/ LINUX device drivers.

(L-4)Design & Integration of Peripheral devices to a computer system as a Case Study

(L-2)**Future Trends:** Detailed Analysis of recent Progress in the Peripheral and Bus systems. Some aspects of cost Performance analysis while designing the system

(L-2)Text/ Reference:

1. P. Pal Chandhari , “Computer Organization and design” Prentice Hall of India Pvt. Ltd, 1994.
2. Del Corso, H.Kirrman, JD Nicond “Microcomputer buses & links” Academic Press 1986.
3. Douglas V Hall “Microprocessor & Interfacing Programming & H/W” McGraw Hill Education 1992
4. Scott Muller, “Upgrading and repairing PC”

CS– 313 Software Lab – V (DATABASE MANAGEMENT SYSTEMS)

**External Marks: 20 L T P Internal Marks: 30 - - 4 Total
Marks: 50**

1. Introduction to DBMS. 2. To implement different types of DDL, DML and DCL statements in SQL. 3. To use constraints on the created database. 4. To explore 'select' clause using where, order by, between, like, group by, hav ing

etc. 5. To implement different in-built functions on the created database.

6. To implement nested and correlated queries.

CS - 315 HARDWARE LAB – IV

Computer Networks

**External Marks: 20 L T P Internal Marks: 30 - - 2 Total
Marks: 50**

1. Conversion of Analog to digital signals. 2. Conversion of digital to analog signals. 3. Conversion of Analog to Analog signals. 4. Conversion of digital to digital signals. 5. Implementation of multiplexers. 6. To study FDM modulation techniques. 7. To study TDM modulation techniques 8. To study WDM modulation techniques 9. To study various transmission media like twisted pairs, co -axial

cables,optical fibers etc.

CS - 317 SOFTWARE LAB – VI

(Algorithms)

External Marks: 20 L T P Internal Marks: 30 - - 2 Total
Marks: 50

Experiments to plot growth of functions. Implementing heuristics and comparison with algorithms designed with asymptotic complexity in Comparison of various data structures for the same algorithm. Experiments with software packages like LEDA.

CS - 319 SOFTWARE LAB – VII

(Computer Graphics)

**External Marks: 20 L T P Internal Marks: 30 - - 2 Total
Marks: 50**

Do two line segments intersect.

Compute the convex hull of a set of planar points.

Sean convert line segments.

Clip line segments against windows.

Fill polygon with stipple patterns.

Use Phigs to show objects in various views.

The truncated cube of Module 3 employed here.

Display the view volume.

Show a unit cube in perspective.

Implement the de Casteljau algorithm for curves.

Demonstrate the properties of the Bezier curves Run a sample session on Microsoft Windows including the use of Paintbrush.