## SCHEME OF INSTRUCTION AND EXAMINATION
### MCA IIInd YEAR
#### FACULTY OF INFORMATION TECHNOLOGY

### SEMESTER-I

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<th>Syllabus Ref.no</th>
<th>Subject</th>
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<td>CS 701</td>
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CS-701

DATA COMMUNICATIONS

Instruction: 4 Periods per week
Duration of University Examination: 3 Hours
University Examination: 80 Marks
Sessional: 20 Marks

UNIT-I

Instruction: Communication model, Data Communication networking, Protocols and Architecture, Standards.


Data Encoding: Digital Data-Digital signals, Digital Data –Analog Signals, Analog Data Digital Signals, and Analog Data-Analog Signals.

UNIT-II

Data Link Controls: Flow Control, Error Detection, Error Control, HDLC, other Data link Control protocols, performance issues.

UNIT-III

Multiplexing: Frequency Division Multiplexing, Synchronous time-Division Multiplexing, Statical Time -Division Multiplexing, Asymmetric Digital Subscriber line, xDSL, Circuit Switching, Packet Switching & Frame Relay.

UNIT-IV

Traditional Ethernet: Topologies and Transmission Media, LAN protocol architecture, MAC sub layer, CSMA/CD, Physical Layer, Implementation, Bridged, Switched and full duplex Etherments, Layer 2 and Layer 3 Switches.

Fast Ethernet: MAC sublayer, Physical Layer, Implementation

Gigabit Ethernet: MAC sublayer, Physical Layer, Implementation.

UNIT-V


Suggested Reading:
CS-702

DATA BASE MANAGEMENT SYSTEMS

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 80 Marks
Sessional 20 Marks

UNIT-I

The Entity-Relationship Model: Overview of Database Design, Entities, Attributes, relationships, Extended ER Model features

The Relational Model: Introduction to the Relational Model Integrity Constraints over relations, ER to Relational, introduction to views, Destroying / Altering Tables and views.


UNIT-II

Relational Algebra and calculus: Preliminaries, Relational Algebra, Relational calculus, expressive, power of algebra and calculus.
SQL: Queries, Programming, Triggers: SQL queries, nested queries, Joins, aggregate functions, null values, embedded SQL, cursors, Dynamic SQL, Triggers and Active database, designing active databases.

UNIT-III

File Organizations and Indexes: Cost Model, comparison of three files Organizations, overview of indexes, properties of indexes.

Tree-Structured indexing: Indexed sequential access method (ISAM) B+ Trees: A dynamic index structure, format of a node, search, Insert, delete, duplicates+ Trees in practice.

Hash-Based Indexing: Static Hashing, Extendable Hashing, Linear Hashing, Extendable Hashing versus Linear Hashing.

UNIT-IV

Transaction Management: The Concept of a Transaction, Transactions and schedules, concurrent, execution of transactions, lock-based Concurrency, control.

Concurrency Control: Lock management specialized locking techniques, concurrency control without locking.
UNIT-V

Security: Introduction to database security, access control discretionary Access control, mandatory access control.
Crash Recovery: Log based recovery, Introduction to ARIES, Recovering from a System Crash, Media Recovery.

Suggested Reading:
CS-703

INTERACTIVE COMPUTER GRAPHICS

Instruction 4 Periods per week
Duration of University Examination 3 Hours
University Examination 80 Marks
Sessional 20 Marks

UNIT-I


UNIT-II


UNIT-III
Two-dimensional viewing: The viewing pipeline, viewing transformation, viewing functions, Line clipping, Cohen Sutherland line clipping, Liang Barsky line Clipping.

Polygon clipping: Sutherland-Hodgeman polygon clipping, Weiler Atherton polygon clipping.

UNIT-IV
Three Dimensional Concepts: Three Dimensional Display Methods.
Three Dimensional Object Representations: Polygon surfaces, curved line and surfaces, spline representations, Bezier Curves & Surfaces, BSP line Curves and Surfaces, Constructive Solid-Geometric Methods, Octrees, BSP trees, Fractal geometric methods.

UNIT-V

Three Dimensional Geometric and Modeling Transformations.
Three Dimensional viewing: Projections.
Visible Surface Detection Methods: back face deletion method, depth buffer method
Basic illumination methods: Phong & Gourand Shading, Texture Mapping.

Computer Animation: Design of Animation Sequences, General Computer Animation,
Raster Animations, Computer-Animation Languages, Key-frame Systems, Motion
Specifications.

Suggested Reading:
   Me GrawHill.
CS-704 OPERATING SYSTEMS

Instruction                                      4 Periods per week
Duration of University Examination              3 Hours
University Examination                          80 Marks
Sessional                                       20 Marks

UNIT-I

Introduction to operating systems: OS structure and strategies, Process concept, Interprocess communication, Threads, Multithread Programming.


UNIT-II

Memory Management, swapping, contiguous allocation, paging, Static and dynamic partition, demand paging, page replacement Algorithms, thrashing, segmentation, segmentation with Paging.


UNIT-III

Process synchronization: Critical Section problem, Semaphores, monitors.
Deadlocks: Necessary conditions, resource allocation graph, methods for handling deadlocks, preventions, avoidance, detection and recovery Protection_Goal, domain of protection, access matrix.

UNIT-IV

Device Management: Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap Space Management, RAID structure, Stable storage Implementation.
I/O System: I/O hardware, Application I/O Interface, kernel I/O Subsystem, Transforming I/O request to hardware operation, STREAMS.

UNIT-V

Case studies

Windows XP: General Architecture. The NT Kernel, the NT Executive.

Suggested Readings:
# CS-705

## OPERATIONS RESEARCH

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<th>Instruction</th>
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### UNIT-I
Linear programming problems, graphical solution, simplex, method.
Degeneracy, Big M-method, two phase method.

### UNIT-II
Revised simplex method, dual linear programming problem, and dual simplex method.

### UNIT-III

### UNIT-IV
Sequencing problems, two machine sequencing problem, N-job, Three machine problem, Project network, CPM and PERT.

### UNIT-V
Decision theory, Minimax decision procedure, Game theory, pure strategies, expected payoff, solution of 2 x 2 games dominance, Solution of 2 x n and m x 2 games, Brown’s algorithms.

### Suggested Readings:
CS-731
PROGRAMMING LAB-V
(DBMS Programming)

Instruction 3 Periods per week
Duration of University Examination 3 Hours
University Examination 50 Marks
Sessional 25 Marks

I. SQL/PL-SQL:
1. Creation of database (exercised the commands for creation)
2. Simple to complex condition query creation using SQL plus
3. Demonstration of blocks, cursors & database triggers.

II. Forms/Reports:
4. Creation of forms for the case study assigned.
5. Creation of Reports based on different queries.
6. Creating password and security features for applications.
7. Usage of file locking table lockinfacilities in applications.
8. Creation of Small full fledged database application spreading over to 3 sessions.

Note:
(i). Use Case Studies such as Library Information System, Pay roll system, Bank Information system, Reservation system, Inventory system etc.,

(ii). The creation of Sample database for the purpose of the experiments is expected to be pre-decoded by the instructor based on the case study assigned to the students.

(iii). Preferable Oracle DBMS package should be used to carry the Lab experiments.
CS-732

PROGRAMMING LAB-VI
(OPERATING SYSTEMS LAB)

Instruction: 3 Periods per week
Duration of University Examination: 3 Hours
University Examination: 50 Marks
Sessional: 25 Marks

1. Printing file flags for specified descriptor.
2. Print type of file for each command line arguments.
3. Recursively descends a directory hierarchy counting file types.
4. Programs using process related systems calls.
5. Programs to create threads.
6. Program using Signals.
7. Echo server-using pipes.
8. Echo server-using messages.
9. Producer & Consumer Problem using Semaphores and Shared memory
11. Readers & Writers Problem using message passing.
12. Dining philosopher’s problem using semaphores.
14. Understanding and submitting and assignment on RC scripts.
15. Programs using Linux shell script (Note 2 Shell Programs covering the salient feature of Shell)