

**SCHEME OF INSTRUCTION AND EXAMINATION  
BCA 2<sup>nd</sup> YEAR –I Sem**

**FACULTY OF INFORMATION TECHNOLOGY**

SI No.	Syllabus Ref. No.	Subject	Scheme of Instruction			Scheme of Examination		
			Periods per week			Duration in hrs	Maximum Marks	
			L	T	P		Univ. Exam	Sessionals
		<b>THEORY</b>						
1	BCA201	Effective Communications	3	1	-	3	75	25
2	BCA202	Data Analysis	3	1	-	3	75	25
3	BCA203	IT Hardware	3	1	-	3	75	25
4	BCA204	Data Structures	3	1	-	3	75	25
5	BCA205	Organization & Functions	3	1	-	3	75	25
		<b>PRACTICALS</b>						
6	BCA231	IT Hardware Lab			6	3	50	25
7	BCA232	Data Structures Lab			6	3	50	25
<b>TOTAL</b>			15		12		475	175

**WITH EFFECT FROM THE ACADEMIC YEAR 2015-2016**

**SCHEME OF INSTRUCTION AND EXAMINATION  
BCA 2<sup>nd</sup> YEAR II-Sem**

**FACULTY OF INFORMATION TECHNOLOGY**

SI No.	Syllabus Ref. No.	Subject	Scheme of Instruction			Scheme of Examination		
			Periods per week			Duration in hrs	Maximum Marks	
			L	T	P		Univ. Exam	Sessionals
		<b>THEORY</b>						
1	BCA251	Basic Electrical & Electronics Engineering	3	1	-	3	75	25
2	BCA252	Operating Systems	3	1	-	3	75	25
3	BCA253	Data Communications & Networking	3	1	-	3	75	25
4	BCA254	Web Technologies	3	1	-	3	75	25
5	BCA255	Database Design	3	1	-	3	75	25
		<b>PRACTICALS</b>						
6	BCA281	Operating systems Lab			6	3	50	25
7	BCA282	Web Technologies Lab			6	3	50	25
8	BCA283	Database Design Lab			6	3	50	25
<b>TOTAL</b>			15		18		525	200

**BCA 201**

**EFFECTIVE COMMUNICATIONS**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** The course enables the student to improve oral-aural and written communication skills.

**UNIT-I:**

*Objective: To improve writing skills for effective Communication.*

Writing a dialogue (Introduction, asking for: information, permission)

Dialogue Writing on the basis of a short-story, newspaper report, print and or visual media. Writing advertising copy, descriptive writing.

**UNIT-II:**

*Objective: To improve Writing Skills (at an advanced level)*

Preparing a CV. application for a job, Essay Writing, Documentation based on research and database.

**UNIT-III:**

*Objective: To improve aural skills and to improve presentation skills.*

Listening for specific information, formal/informal speech, use of language in a given situation.

**UNIT-IV:**

*Objective: To develop oral skills and to improve presentation skills.*

Formal/informal speech, using language in a given situation.

**UNIT-V:**

Presentation skills (TUTORIAL) Group Discussion, Simulated situations.

N.B: Units III. IV & V Source Material: Print / Audio - Visual/Multi - media

**Suggested Reading :**

1. Spoken English (Tata McGraw Hill) (Text & Audio Cassette)
2. Strengthen Your Writing (Orient Longman)
3. Krishnaswamy & Sriraman (Macmillan), Current English for Colleges
4. Sarah Freeman (Orient Longman) , Written Communication in English by
5. Ian Gord on (Macmillan), Brendan J Carroll (Macmillan), English for Colleges, Common Errors in Written English

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** The course enables various methods to better forecast for economic problems

**Objective:** To learn various probability and statistical techniques to quantify the qualitative variables.

#### UNIT-I

**Grouping and displaying data to convey meaning** - arrangement of data, examples of raw data, frequency distribution, graphing frequency distribution Measures of central tendency - arithmetic mean, weighted mean, geometric mean, Median, mode, Dispersion, measures of dispersion, average deviation measures, coefficient of variation, exploratory data analysis

#### UNIT-II

**Probability** - Basic terminology, Three types, Probability rules, Statistical independence, statistical dependency, Bayes' theorem

**Probability distributions** - random variables, expected values, binomial distribution, Poisson distribution, normal distribution, choosing correct distribution Sampling and sampling distributions - Random sampling, design of experiments, sampling distributions, operational considerations in sampling

#### UNIT-III

**Estimation** - Point estimates, interval estimates, confidence intervals, calculating interval estimates of the mean and proportion, t-distribution, determination of sample size in estimation

**Testing Hypotheses** - one sample tests, hypotheses testing of mean when the population standard deviation is known, powers of hypotheses test, hypotheses testing of proportions, hypotheses testing of means when std is not known

#### UNIT-IV

**Testing Hypotheses** - Two sample tests - tests for difference between means - large sample, small sample, with dependent samples, testing for difference between proportions, probe values Chi-square and analysis of variance - chi-square as test of independence, chi-square as a test of goodness of fit, analysis of variance, inferences about a population variance, inferences about two population variances.

#### UNIT-V

**Simple regression and correlation** - Estimation using regression line, correlation analysis, making inferences about population parameters, limitations, errors and caveats in regression and correlation analysis multiple regression and modeling - finding multiple regression equations, inference about population parameters, modeling techniques.

#### Suggested Reading:

1. Richard I Levin, David S Rubin - Statistics for Management, Seventh Edition, PHI -1997

**BCA 203**

**IT HARDWARE**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** To develop skills in hardware development so as to enable the graduates to take up self-employment in Indian & global software market.

**Objectives:**

- To Know the Basics Of various Computer components
- To understand how to solve the issues related to hardware in day to day activities

**UNIT-I**

**Overview of computer systems** – features and components. Mother board – Types, Components; Form factors, interface connections, Bus-Introduction, types-ISA, MCA, EISA, Local Bus, Fire wire, USB, System resources Microprocessor – Processor specification and latest Processors, Motherboard ROM BIOS, BIOS Basics.

**UNIT-II**

**Memory** – System logical memory, physical memory – RAM types, cache, Power supply – Functions and operation, power protection systems, I/O devices – Keyboards, mice, Touch screen / Touchpad, Printers, Speakers, UPS

**UNIT-III**

**Video Display** – Monitors and Types, Video cards-types, Communications – Serial ports, parallel ports, Fire Wire Port, USB, components of LAN, LAN cables, PCMCIA, Audio – sound card – Applications, concepts and terms, characteristics options, installation

**UNIT-IV**

**Hard disk drives** – Definitions, Form – Factors, Operation, Components, Features, Hard Disk Interfaces – choices, IDE, SCSI; Removable Storage : DVD, Blue ray disk, USB flash drive specifications, disk and drive formats.

**UNIT-V**

**Building a system** – Tools for maintenance. Disassembly and reassembly procedures, preventive maintenance. Active preventive maintenance, Hard disk maintenance, passive preventive maintenance. Diagnostic tools – POST, IBM Diagnostics, general purpose diagnostic programs, Disk Diagnostics. Operating Systems software and troubleshooting - Input devices, Audio / Video cards, Motherboard, Memory, Processor

**Suggested Reading:**

1. Scott Mueller – Upgrading and Repairing, PCs – 20<sup>th</sup> Edition, QUE (Pearson) – 2013.

## BCA 204

## DATA STRUCTURES

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** To course enables the students to understand various programs using object orientation and types of Data Structures and their algorithms.

### Objectives:

- To understand basic notions of object oriented programming through C++
- To acquire object-oriented problem solving skills and to write programs in C++
- To understand the concepts of various Data Structures and their algorithms

### UNIT - I

**Introduction to C++:** Programming paradigms, Object Oriented Programming Concepts, Advantages and Applications of OOPs, **Functions:** Call by value, call by reference, Inline Functions, Function Overloading, Recursion, **Arrays:** Introduction to Arrays, Arrays in functions, Programming with Arrays and multidimensional Arrays

### UNIT - II

**Defining classes:** Classes, Abstract data types. Friend Functions and Member Functions, Constructors, Destructors, Strings, Pointers and Dynamic Arrays.

### UNIT – III

Operator overloading, **Inheritance:** The notation of inheritance, derived classes, overriding, Virtual Base Class, Virtual functions, Polymorphism, Exception Handling, Function Templates, Class Templates.

### UNIT-IV

**Introduction to Linear Data Structures:** Linear Lists, Stacks, Queues using Array Representation and Linked Representation, Applications of Stacks and Queues. Hashing, Collision Resolution.

### UNIT – V

**Non-Linear Data Structures:** Binary Trees, properties, Representation, and Traversals, AVL Trees, Operations on AVL Trees, B-Trees, Graphs: Definition, Representation, Traversals.

### Suggested Reading:

1. Walter Savitch, Problem Solving with C++, 6th Edition, Pears Education Publishing, 2009.
2. Bjarne Stroustrup, The C++ Programming Language, 3rd Edition, Pearson Education.
3. Sartaj A Sahani, Data Structures and Algorithms, Tata McGraw Hill, 2013.

BCA 205

**ORGANISATION AND FUNCTIONS**  
(handled by Management / Commerce teachers)

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** The course enables different management techniques to solve managerial problems.

**Objective:** To understand the various managerial skills for decision – making.

**UNIT-I**

**Management-** Definition, types of managers, responsibilities, tasks, Leadership and motivation –nature of leadership, leadership theories, delegation, defining motivation, Motivation theories, defining needs, motivation techniques, Time management – importance of time characteristics of management tasks, determining time elements, time management techniques, Organization- definition, structures, quality, organizational change, managing change.

**UNIT-II**

**Financial Management** - Financial environment - basics, financial accounts, inflation, profitability, Budgets and controls. Obtaining finance, valuing a company, Costing-cost accounting, valuation of stock, allocation of overheads, standard costing, variances, marginal costing, Investment Decisions - definition, ranking process, payback period, average rate of returns, discounted cash flows

**UNIT-III**

**Project and operations management** - Project planning and control - projects and management, network analysis, critical path. Gantt chart, resource analysis, planning under uncertainty, Manufacturing operations - manufacturing environment, experience curve, manufacturing technology, global operations, logistics, design, quality.

**UNIT-IV**

**Marketing and Sales management** - Markets and Marketing- market, marketing information, market segmentation, consumer and industrial markets Product management, sales and distribution-product management, pricing, marketing communications, sales, physical distribution.

**UNIT-V**

**Decision making** - The nature of decisions, decision making process, decision making techniques Mathematical models in decision making - Modeling, linear programming, inventory control, queues, competitive strategy Forecasting - Forecasting the future, qualitative methods, time series, casual methods.

**Suggested Reading**

1. Fraidoon Mazda - Engineering Management - Addison Wesley 1998.

**BCA 231**

**IT HARDWARE LAB**

Instruction	6 Hours per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

Note: The Laboratory is conducted with one hour demonstration / lecture followed by 2 hours of practice. Part-I and Part-II can be held in parallel.

**Part-I**

1. Identifying external ports and interfacing of peripherals such as monitor, keyboard, mice, speakers, printers, modern etc.
2. Identifying PC cards such as mother board, memory board, display card, NIC card, Sound blaster card etc.
3. Identifying the ports on cards and interfacing Hard disks, CDROMs, DVDs
4. Disassembling and assembling of PC
5. Preventive maintenance of PC
6. Understanding of CMOS setup
7. Soldering RS-232C connector
8. Crimping RJ-45 connector
9. Partitioning and formatting Hard disks.
10. Loading windows operating system and device drivers
11. Understanding control panel settings
12. Setting up the properties of network neighborhood and copying files from another system.
13. Installation of application software
14. Installation of multimedia
15. Prevent power surges protect HD data
16. Test serial and parallel ports
17. Hard ware trouble shooting – solving common windows problem. Example running error, drive error, program not responding, restart without warning, booting slow.



**BCA 232**

**DATA STRUCTURES LAB**

Instruction	6 Hours per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

1. Implementation of ADT Stacks (Arrays and Linked representation)
2. Infix to Postfix conversion (un parenthesized)
3. Infix to Postfix conversion (Parenthesized).
4. Evaluation of postfix expression.
5. Implementation Parenthesis Matching Application using Stack.
6. Implementation of ADT Queues. (Linear, Circular and De Queue)
7. Application of Queues (Super-market, Ticket reservation etc)
8. Implementation of ADT Linked Lists (Singly, Doubly and Circular)
9. Implementation of Linear, Binary Search.
10. Implementation of Hashing.
11. Implementation of Collision Resolution Techniques.
12. Implementation of Insertion Sort.
13. Implementation of Selection Sort.
14. Implementation of Shell Sort.
15. Implementation of Quick Sort.
16. Implementation of Merge Sort.
17. Implementation of Basic Operations on Binary Trees.
18. Implementation of Traversals on Binary Trees.
19. Implementation of Binary Search Trees.
20. Implementation of Heap Sort.
21. Implementation of Operation of AVL Trees.
22. Implementation of Red-Black Trees.
23. Implementation of Graph Search Methods.
24. Program to find the minimal Spanning tree

**BCA 251**

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:**

Students will be able to explain basic circuit concepts and responses, will be able to do linear modeling of passive elements and sources, will be able to use analytical techniques in resistive circuits, will be able to acknowledge the principles of operation and the main features of electric machines and their applications, will be to acquire skills in using electrical measuring devices, will be able to analyze the structure of different types of semiconductor

**Objectives:**

To understand Single Phase A.C Circuits

To understand Resonance concept

To understand magnetic circuits

The course intends to provide an overview of the principles, operation and application of the basic electronic components.

Understand the Characteristics of the active devices.

**UNIT-I**

**Electricity** - Negative and positive polarities, Electrons and Protons, Structure of Atom, Coulomb, Potential difference, current, resistance, closed circuit, direction of current, DC and AC, sources of electricity Resistors - Types, color coding, Power ratings, Series and Parallel combinations Ohm's Law - Three formulas of ohm's law, Electric Power. Power dissipation, Power formulas, Choosing a resistor, Electric Shock

**UNIT-II**

**DC meters** - Moving coil, measurement of current, meter shunts, Voltmeters, loading effect of a Voltmeter, Ohmmeter, Multi meter, DMM, Meter Applications, checking continuity with Ohmmeter Kirchhoff's Laws - Current Law, Voltage Law Conductor - Function, standard wire gages, types, connectors, printed wiring, switches, fuses, Wire resistance. Temperature Coefficients, Insulators

**UNIT-III**

**Batteries** - General features. Voltaic cell. Carbon -Zinc Dry cell Alkaline cell, Dry cells, Lithium cell, Lead-Acid wet cell, Series and Parallel cells. Current drain, Internal resistance, Alternating Voltage and current, - AC applications, Voltage generator, sine wave, alternating current, frequency, period, wave length, phase angle, motors and generators, 3-phase AC power

**UNIT-IV**

**Capacitance** - charging and discharging. Farad, Typical capacitors, electrolytic capacitor, capacitor coding, parallel capacitance, serial capacitance, Magnetism - Magnetic field, Flux, Flux density. Induction by magnetic field, Types of magnets, ferrites, magnetic shielding, Inductance - Induction, self-inductance, Mutual inductance. Transformers, Transformer ratings and impedance

## **UNIT-V**

**Electronic Devices** - Semiconductor, PN junction, diode, transistor, FET, Electronic circuits - Analog and digital signals, Amplifier gain, characteristics of amplifier circuits, oscillators. Modulation, rectifiers  
**Digital Electronics** - Logic gates, Active high/active low terminology. Combinational logic circuits, Flip-Flops, counters

### **Suggested Reading**

1. Bernard Grob, Basic Electronics, Eighth Edition, McGraw 1997

**BCA 252**

**OPERATING SYSTEMS**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:**

Apply optimization techniques for the improvement of system performance.

Ability to understand the synchronous and asynchronous communication mechanisms in their respective OS.

Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.

Ability to compare the different OS

**Objectives:**

- Understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- Understand the scheduling policies of OS
- Understand the different memory management techniques
- Understand process concurrency and synchronization
- Understand the concepts of input/output, storage and file management
- To study different OS and compare their features

**UNIT-I**

**Operating Systems** - functions, virtual computer, Hardware Interface – CPU, memory and addressing , Interrupts, I/O devices  
Operating System Interface – System calls, example system call interface, naming OS objects, Devices as tiles, Process concept, Communication between processes, standard input and output, OS examples , shell, Processes - creation, states, dispatching, system stack, timer interrupts, System initialization,, process switching, System call interrupt handling, Disk driver subsystem, implementation of waiting, flow control, signaling. Interrupt handling, event and table management , process tables and process descriptors.

**UNIT-II**

**IPC pattern** - Mutual exclusion, signaling, rendezvous, producer-consumer, client-server, database access and update , Deadlock - conditions for deadlock, dealing with deadlocks, two-phase locking  
Message passing variations - Synchronization, Semaphores, program language based synchronization primitives, IPC and Synchronization examples Thread - concept, system calls, advantages, uses, examples

**UNIT-III**

**Memory management** - Linking and loading a process, dynamic linking, examples of dynamic memory allocation, multiprogramming issues, memory protection, memory management system calls Virtual memory - dealing with fragmentation, virtual memory implementation, management, daemons and events, file mapping, page replacement, trashing and load control, two level paging, Segmentation, Sharing memory, examples of virtual memory systems

#### **UNIT-IV**

**I/O Devices** - Devices and controllers, Disk drives, disk controllers, I/O System software. Device driver access strategies. Unification of Files and devices, Generalized disk [device drivers. Disk caching, Examples of I/O systems File System - need for files, file abstraction, file naming, file system objects and operations, implementation of file system, example of file system, IT File System organization - file descriptors, locating file blocks, file system reliability, security and protection, examples of file systems

#### **UNIT-V**

**Resource Management** - Resources in OS, types of resources, protection of resources, user authentication, protecting hardware resources, representation of protection information, Mechanisms for software I protection, examples of protection attacks, protection examples. Glyptography in computer security, Client-Server model - System processes, Micro-kernel OS, development towards a distributed system

#### **Suggested Reading**

1. Charles Crowley - Operating Systems - A design Oriented Approach, McGraw 1997

**BCA 253**

**DATA COMMUNICATIONS AND NETWORKING**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:**

Ability to understand the fundamentals and the framework necessary to keep pace with changes in networking technologies.

Ability to make intelligent decisions about the appropriate design, integration and use of Data Communications equipment and systems.

**Objective:**

To learn about Data Communications in this introductory course in networking technology.

**UNIT-I**

**And transmission** - Digital data transmission, DTE DCE interface, Interface Standards - EIA-449, EIA-530,X.21., Modems Introduction - Data communication Networks, protocols and standards, standards organizations  
Basic concepts - Line configuration, topology, transmission mode categories of networks, internet works OSI Model. Layered architecture, functions of the layers. Signals - Analog and digital, a periodic and periodic signals, analog signals, digital signals, Encoding - Digital to Digital, Analog to Digital, Digital to Analog, Analog to Analog

**UNIT-II**

**Interfaces Transmission Media** - Guided media, Unguided media, performance Multiplexing - types, telephone system, Error detection and correction - types of errors, detection, correction

**UNIT-III**

**Data Link control** - Line discipline, flow control, error control, Data Link protocols - Asynchronous, Synchronous, Bit-oriented, Local Area Networks - Project 802, Ethernet Token bus, Token ring, FDDI Metropolitan Area Networks-IEEE 802.6, SMDS , Switching - Circuit, packet, message, Network layer

**UNIT-IV**

**ISDN** - Services, History, Subscriber access, layers, Broadband ISDN X.25 - layers, packet layer protocol  
Frame Relay - layers, operation, implementation, ATM - Design goals, topology, Protocol architecture  
SONET/SDH - physical configuration, layers, sonnet frame, multiplexing STS frames

**UNIT-V**

**Networking and Internetworking Devices** - Repeaters, bridges, routers, gateways, routing algorithms  
Transport Layer-duties, connection, OSI transport protocol Session layer, presentation layer, application layer  
TCP/IP - overview, network layer, transport layer, application layer

**Suggested reading**

1. Behrouz Forouzan, Catherine Coombs, Sophia Chung Fegan- Introduction to Data Communications and Networking, McGraw 1998

**BCA 254**

**WEB TECHNOLOGIES**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:**

- Design and develop various web based applications using JavaScript and servlets
- Use JDBC in JSP pages, Create web forms with JQuery.
- Design web site using HTML

**Objectives:**

- To design and develop web pages using html5, CSS positioning, servlets and JDBC.
- Understanding and writing a well-formed XML schemas and documents.
- Using JSP as view component in MVC based web applications.

**UNIT-I**

Introduction to World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, HTTP, Basic of HTML5, Adding the content: Links, Images, Multi Media, Lists, Tables, Creating Forms, Styling Forms.

**UNIT-II**

Introduction to XML, XML document structure, Document Type Definition, Namespaces, XML Schemas, Displaying raw XML documents, Displaying XML documents with CSS, X Path Basics, XSLT, XML Processors.

**UNIT-III**

Introduction to Java script, java script and forms Variables, Functions, Operators, Conditional statements and Loops, Arrays DOM, Strings, Event and Event Handling, Java Script Closures. Introduction to Ajax, Pre-Ajax java Script Communication techniques, XML Http Request Object, Data formats, Security Concerns, User Interface design for Ajax. Introduction to Python, Objects and Methods, Flow of Control, Dynamic web pages.

**UNIT-IV**

**Java Servlets:** Java Servlets and CGI Programming, Benefits of Java Servlet, Life cycle of Java Servlet, Reading data from client, HTTP Request header, HTTP Response header, working with cookies, Tracking Sessions. Java Server Pages: Introduction to JSP, JSP Tags, Variables and Objects, Methods, Control Statements, Loops, Request String, User Sessions, Session Object, Cookies.

**UNIT-V**

**Introduction to PHP:** Overview of PHP, General Syntactic Characteristics, Primitives, Operations, Expressions, Control Statements, Arrays, Functions, Pattern matching, Form handling, Files, Cookies, Session Tracking. Database access Through Web: Architectures for Database Access- Database access with Perl - Database access with PHP-Database access with JDBC.

**Suggested Reading:**

1. Robert W. Sebesta, "Programming the World Wide Web", Third Edition, Pearson Education, 2006.
2. Wendy Willard "HTML5" McGraw Hill Education (India) Edition, 2013
3. Powell, The Complete Reference AJAX, Tata-McGraw-Hill, 2011.
4. John Pollock, "Java Script" Fourth Edition, McGraw Hill Education (India) Edition, 2013.
5. Jim Keogh, The Complete Reference I2EE, Tata-McGraw-Hill, 2002.



**BCA 255**

**DATA BASE DESIGN**

Instruction	3 Hours per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

**Scope:** Demonstrate the basic elements of a relational database management system.  
Ability to identify the data models for relevant problems.  
Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data.  
Apply normalization and professional attitudes for the development of application software's.

**Objectives:** The objective of the course is to learn the foundation of Database Technologies.  
In this course, student will learn to design a database, normalize it by eliminating the redundancies, Querying, Improve the database performance by Indexing, Hashing and finally optimize the queries and Transaction Management.

**UNIT-I**

**Database environment:** Basic concepts & Definitions, Traditional File based system, Limitation of file based approach, Database Approach, DBMS, Database applications, Components of DBMS environment, advantages & disadvantages of DBMS, Evaluation database systems. Database Development process: Information Development process, SDEC, ANSI/SPARC, Three-schema architecture, 3-tier architecture, case studies.

**UNIT-II**

**E-R Model** - Entities, attributes, Relationships, degree and cardinality, entity types versus entity instances - case studies

**Enhanced E-R model** - super type, sub type, specialization and generalization, constraints, disjointness, subtype discriminator, super type /subtype hierarchies, business rules, scope classification, structural constraints operational constraints, case study.

**Relational model** - Definitions, integrity constraints, transforming EER diagrams into relations, case study.

**UNIT III**

**Relational algebra and calculus** -operators of relational algebra, relational calculus SOL -1 history, role, environment, defining databases in SOE, inserting, updating and deleting data, Internal schema, processing single tables, processing multiple tables, view definition, transaction integrity, triggers and procedures, case study. Normalization: need for normalization, The normalization process: 1-NF,2-NF,3-NF, improving the design, Surrogate key consideration, Higher level normal form: CNF,4NF,normalization and Database design process, Demoralization, case study

#### **UNIT IV**

**Client/server and middleware** - client/server architectures, three-tier architecture - partitioning, middleware, Security issues. Database access from client applications - using query by example, building a client applications, using OLE, COM and Active X controls, embedded SQL, VBA, building Internet Database Servers. Distributed databases - Data replication, partitioning transparency, concurrency and commit protocol, distributed database products

#### **UNIT V**

Database Administration role of data and database Administrator, modeling and planning for database, managing data security backing up databases, controlling concurrent access, managing data quality and dictionaries and repositories, tuning the database, case study. DBMS selection and Implementation - analyzing information needs, DBMS functions and capabilities, future requirements, feature availability and performance, evaluation models, implementation issues. Professional, Legal, and Ethical Issues in Data Management.

#### **Suggested Reading:**

1. Fred R Me Fadden, Jeffrey A Hoffer, Mary B Prescott - Modern Database Management, Fifth Edition., Addison Wesley 1999
2. Gary W Flausen, James V Hausen, Database Management and Design, Second Edition. PHI 1996

**BCA 281**

**OPERATING SYSTEMS LAB**

Instruction	6 Hours per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

**Note:** The Laboratory is conducted with one hour demonstration/ lecture followed by 2 hours of practice. The different parts should be done in parallel

**Part-I (LINUX)**

1. Familiarity of UNIX shell commands
2. Development of shell scripts
3. Installation of UNIX
4. Creating users and groups
5. Adding a device
6. Setting up a mail account
7. Adding terminals
8. File system operations - fsck, creation of Unix file system on floppy
9. Backup and restoration of files
10. Setting up TCP/IP
11. Setting up DNS
12. Understanding system parameters

**Part-II (Windows-8)**

1. Installation of Windows-NT
2. Creation of users, groups and privileges
3. Adding printers
4. Configuring TCP/IP, WINS, DHCP
5. Integrating NT with Unix
6. Installing and configuring Windows Messaging
7. Backup and restoration of files
8. Setting up internet server with US
9. Configuring windows/95 and other PC clients to the network
10. Understanding Registry

**BCA 282**

**WEB TECHNOLOGIES LAB**

Instruction	6 Hours per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

1. Creating HTML pages to test different Tags.
  - a) Headers
  - b) Linking Images.
  - c) Images as anchor.
  - d) Text Formatting,
2. a) HTML Table formatting
- b) Ordered and Unordered lists.
3. Creating Frames
4. Examination result in java Script.
5. Create Ion of Quiz program. 6, Usage Data and the methods of Date and Time objects.
6. Floating alerts, aligning text and setting box dimension using CSS.
7. Demonstrating object hierarchy using collection children.
8. Using HTML Events.
9. Using Transition & Filters like Flip filter, Chrome filter, Shadow filter etc"
10. VB script classes and regular expression.
11. Installing Web Server (PWS or IIS).
12. Guest book Active Server pages,
13. Creation of Small full fledged database application using ADO spreading over to 3 sessions

**BCA 283**

**DATA BASE DESIGN LAB**

Instruction	6 Hours per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

**Note** - Use multi-user RDBMS in the server and either ORACLE Developer 2000 with PL/SQL or Visual Basic as front end. Teaching of front end tools should held in laboratory session.

In this Laboratory, the student is required to create a database containing minimum of 10 tables, creation of input forms with triggers, generation of reports, application programming and advanced queries. The student should, able to integrate the database with office automation tools as spread

sheet packages and perform statistical analysis

A list of 40 cases will be kept on internet at Osmania site for assignment.

The student is to submit a report covering analysis, design, implementation and user manual.

**Steps:**

1. E-R modeling
2. Identifying relations and normalization
3. Creation of Tables
4. Creation of queries
5. Usage of Triggers and stored procedure, exception handling
6. Creation of forms
7. Generation of reports
8. Creation of Views
9. Creation of Users and access privileges
10. Creation of application programs
11. Accessing data from spread sheet packages for analysis