

Semester IV

Data base concepts and Systems
Operating Systems
C++ and JAVA
E-Commerce
SW Engineering

CLASS: B. Sc (Information technology) Semester - IV **SUBJECT: Data base concepts and Systems**

Introduction- Purpose of Database Systems, Views of data, Data Models, Database language, Transaction Management, Storage Management, Database Administrator, Database Users, Overall System Structure, Different types of Database Systems
E-R Model: Basic Concepts, Design Issues, Mapping Constraints, Keys, E-R Diagram, Weak Entity set, Extended E-R features, Design Of an E-R Database Schema, Reduction of an E-R schema to Tables
Relational Model: Structure of Relational Database, The Relational Algebra, The tuple relational calculus, The Domain Relational Calculus, Views
SQL- Background, Basic Structure, SET operations, Aggregate functions, Null Values, Nested Sub queries, Derived Relations, Views, Modification of Database, Joined Relations, DDL, Other SQL features
Transaction- Transaction Concepts, State, Implementations of Atomicity and durability, Concurrent Executions, Serializability, Recoverability, Transaction Definition in SQL.
Concurrency Control- Lock based protocol, Timestamp based protocol, Validation based protocol, Multiple Granularity, Multi version Schemes, Deadlock Handling, Insert and Delete operations, Concurrency in index structure
Query Optimization

Relational Database Design- Pitfalls in Relational-Database Design, Decomposition, Normalization Using Functional Dependencies, and Normalization Using Multi valued Dependencies, Normalization Using Join Dependencies, Domain-Key Normal Form and Alternative Approaches to Database Design
Other Relevant Advance Topics and Applications- Object Oriented Database, Decision-Support Systems, Data Analysis, Data Mining, Data Warehousing, Spatial and Geographic Databases, Multimedia Databases, Mobility and Personal Databases, Information-Retrieval Systems, Distributed Information Systems, The World Wide Web
ORACLE 8.0 Database: SQL, PL/SQL, Developer 2000(Oracle Forms and Reports)
Reference
Database Systems and Concepts, Henry F. Korth, Sliberschatz, Sudarshan, McGraw Hill
DBMS by Date
Fundamentals of Database Systems, Elmasri and Navathe
An Introduction to Database System, C.J. Date
Principles of Database System, Ullman, Galgotia Publications

Oracle : A Beginners Guide, Oracle press
Oracle Client Server Computing, BPB Publications
Object Oriented Database Management, Kemper and Moerkotte, Prentice Hall New Jersey
Object Oriented MultiDatabase System, Omran A. Bukhares & A.K Elmagarmid, Prentice Hall Inc. 1996
Computer Data-Base Organization, James Martin, Prentice-Hall of India pvt ltd
Concepts of Database Management, Phillip. J. Pratt, Joseph. J.Adamski, Course Technology
Database Management and Design, Gary W.Hansen, James V.Hansen, Prentice-Hall of India pvt ltd
Database Management Systems Raghu Ramakrishnan, Johannes Gehrke, Mc raw Hill International Edition
DataBase Systems, design Implementation and Management, Peter Robe Carlos, Coronel, Course Technology, Thompson Learning
Database Systems, Concepts ,Management & Applications Alden C Lorents, James N Morgan, Harcourt Brace College Publishers
Database Systems Concepts, Abraham Siberschatz, Henry F.Korth, S. Sudarshan, Mc Graw Hill International Edition
Term Work
Should contain at least 10 assignments covering the syllabus

Tutorial

Tutorial should contain 5 assignments

Practical

Case Study, & Assignments: One database application to be developed as a part of the course using any relevant database.

CLASS: B. Sc (Information technology) Semester - IV
SUBJECT: Operating Systems

Introduction to operating systems design and implementation.

Basics of operating systems, namely structure, concurrency, scheduling, synchronization, memory management, filesystems and networking.

Ubiquitous computing, security and extensible system architectures, Process Deadlock Distributed Operating Systems and Remote Procedure Calls, Theoretical Foundations Distributed Mutual Exclusion, Protection and Security, Cryptography, Database Operating Systems, Concurrency Control, System Performance Reference

Modern Operating Systems by Tanenbaum

Network operating Systems byWilliam Stallings

Operating systems by Silberschatz

Operating Systems *Concepts and Design* Milan Milenkovic, TMG

Operating Systems Design and Implementation, Andrew S Tanenbaum

Albert S Woodhull, Prentice-Hall of India pvt ltd

Operating Systems with case studies in UNIX NETWARE, WINDOWS NT Achyut S Godbole, TMG

Term Work

Should contain at least 10 assignments covering the syllabus

Tutorial

Tutorial should contain 5 assignments

Practical

Should contain 5 demonstrations / hands on, assignments covering the syllabus using UNIX / Linux / Solaris / IRIX

CLASS: B. Sc (Information technology) Semester - IV
SUBJECT: C++ and JAVA

C++

C++ Fundamentals, Data types, Operators, Preprocessor directives, Declarations, Input & Output, control structures, functions and arrays.

Objects and Classes:

Structures and Classes, Unions and Classes, Data hiding and encapsulation, Private and public members, Member functions, Accessing class members, Objects as function parameters, Static data and member functions, friend functions and friend classes.

Object Initialization and Cleanup:

Constructors, Parameterized constructors, Destructor, Constructor overloading, Constructors with default arguments, Constructors with dynamic operations

Function and Operator Overloading:

Function overloading, functions with default arguments, Inline functions, Unary operator overloading, Operator returning value, Binary operator overloading, Overloading arithmetic, relational and assignment operators.

Inheritance:

Derived and base class, protected members, Overriding functions, Private, protected and public inheritance, Derived class constructors, Levels of inheritance and multiple inheritance

Virtual Functions and Polymorphism:

Virtual Functions, Pure Virtual Functions, Abstract Classes, Using Virtual Functions, Early versus Late binding

Arrays, Pointers and References:

Array of Objects, Initialized and Uninitialized Arrays, Pointer to Object, .this. pointer, Pointer to derived types, Pointer to Class Member, Reference Parameters, Passing Reference to Objects, Returning References, Independent References, Dynamic Allocation Operators, Allocating Objects

Java - Data Types, variables, Arrays, Operators, Control Statements, Introducing Classes, Inheritance, Packages and Interfaces, Exception Handling, Multithreaded Programming, I/O Applets, String Handling, Exploring java.lang, Java.util, Java.I/O, Networking, The Applet Class, Event Handling

Reference

Programming in C++ by Balagurusamy TMH

Starting out with C++ by Tony Gaddis PENRAM International Publishing(India)

Complete JAVA reference by Patrick Naughton

JAVA Unleashed

Complete reference by Herbert shield TMH

Programming in C by Schuam out line series
Let us C++ by Yaswant Kanetkar BPB
Practical C++ Programing O.Reilly
Beginning C++, Ivor Horton
A first book of C++, Gary Bronson
Practical C++ programming, Steve Oualline Shroff Publishers
Teach Yourself C++ Herbert Schildt, TMG
Object Oriented design in c++ using STL, Nicholas J De Lillo, Brooks/Cole,
Thompson Learning
Object Oriented programming using C++ E. Balaguruswamy TMG
Object oriented Programming in C++, Nabajyoti Barkakati, Prentice-Hall of India pvt
ltd
Object Oriented Programming Using C++, Joyce Farrell, Course Technology
Thompson Learning
Object oriented Programming with C++ and JAVA, D.Samantha Prentice-Hall of
India pvt ltd

Term Work

Should contain at least 15 assignments covering the syllabus executed in the
laboratory

Tutorial

Tutorial should contain 5 assignments

Practical

C ++ and JAVA

CLASS: B. Sc (Information technology) Semester - IV
SUBJECT: SW Engineering

- i) Introduction, What is software engineering?
 - ii) Software Development Life Cycle, Requirements Analysis, Software Design,
Coding, Testing, Maintenance etc.
 - iii) Software Requirement Specification, Waterfall Model, Prototyping Model, Iterative
Enhancement Model, Spiral Model, Role of Management in Software Development,
Role of Metrics and Measurement, Problem Analysis, Requirement Specification,
Validation, Metrics, Monitoring and Control.
 - iv) System Design, Problem Partitioning, Abstraction, Top-down and bottom-up
design, Structured Approach, Functional v/s Object-Oriented Approach, Design
specification & verification, metrics, Monitoring & Control
 - v) Coding, Top-down & Bottom-up, Structured Programming, Information Hiding,
Programming Style, Internal Documentation, Verification, Metrics, monitoring &
control
 - vi) Testing, Levels of Testing- Functional Testing, Structural Testing, Test Plan, Test
Cases Specification, Reliability assessment.
 - vii) Software Project Management, Cost Estimation, Project Scheduling, Staffing,
Software Configuration Management, Quality Assurance, Project Monitoring, Risk
Management
- Text Book
Software Engineering- A Practitioners Approach, R. Pressman, McGraw Hill
An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa

Reference:

Object Oriented Modelling and Design, J. Rumbaugh, M. Blaha, W. Premerlani, F. Eddy and W. Lorezen, Prentice Hall of India

Fundamentals of Software Engineering, C. Ghezzi, M. Jazayeri and D. Mandrioli, Prentice Hall of India

Software Engineering, S. L. Pfleeger, MacMillan

Software Engineering Concepts, Richard E. Fairley, TMG

Software Quality, Mordechai Ben-Menachem, Garry S Marlis, Thompson Learning

Term Work

Tutorial

Tutorial should contain 5 assignments

Practical

A group project is essential in a software engineering course. The focus of the project is not to get a lot of code written, but to have a complete working system developed, using proper planning and life cycle. The best way to select a project is to have the students work on some real problems. This is the only way they can get an idea of how to do requirements analysis. The main emphasis of this course is to make students realize the importance of maintaining proper documents such as requirements specification, design, test plan, overall plan etc.

CLASS: B. Sc (Information technology) Semester - IV
SUBJECT: E-Commerce

Introduction, IT and business, E-commerce: Concepts

Electronic Communication, PCs and Networking, E-mail, Internet and intranets. EDI to E-commerce, EDI, UN/EDIFACT

Concerns for E-commerce Growth, Internet bandwidth, Technical issues, Security issues. India E-commerce Readiness, Legal issues, Getting started.

Security Technologies: Cryptography, Public Key Algorithms, Private Key

Algorithms, Hashing techniques, Certification and key Distribution, Cryptographic Applications, Encryption, Digital Signature

Protocols for Transactions. SSL-Secure Socket Layer, SET-Secure Electronic Transaction, Credit Card Business

Electronic Commerce providers. CyberCash, Digicash, VeriSign

Software Package: PGP e-mail encryption software. EDI software developed by NIC for Customs

Text Book

E-Commerce: The Cutting Edge of Business, Kamlesh K. Bajaj & Debjani Nag, Tata McGraw Hill

Reference

Cyber Law and E-Commerce, David Baumer, J C Poindexter, TMG

Cyberlaw Simplified Vivek Sood, TMG

e-Commerce Strategy, Technologies and Applications, David Whiteley, McGraw Hill International

E- Security, Electronic Authentication and Information Systems Security Sundeep Oberoi, TMG