UNIT 1 - OOPs Fundamental:
- OOPs terminology, data abstraction, data hiding, encapsulation, class, object and methods, inheritance, polymorphism, merits & demerits of OO methodology.

UNIT 2 - C++
- Basic:
  - Structure of C++ character set, tokens-keywords, variables, constants, special characters, data types & sizes, operators- arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise, special-extraction & insertion operation, scope resolution, member dereferencing, memory management, operator manipulator, type cast, qualifiers, symbolic constant, operator precedence, reference variable, statements - assignment, if-else, nested if-else, for loop, while, do while, break, switch, continue, goto.

UNIT 3 - Functions in C++:
- The main function, function prototype, call by reference, return by reference, inline functions, default argument, friend & virtual functions, introduction to pointers.

UNIT 4 - Classes and Objects:
- Declaration of arrays & structure, specifying class and definition of class, class members, accessing class members, defining member functions-within class & outside class. Array within class, memory allocating for objects, array of objects, pointer to members.
- Constructors & Destructors:
  - Introduction to constructors, parameterized constructors, multiple constructors in a class, dynamic initialization of objects, copy constructors, destructors.

UNIT 5 - Operator Overloading & Inheritance:
- Defining operator overloading, overloading - unary & binary operator, defining derived classes, inheritance type, this pointer, virtual functions.

File Input / Output: File handling in detail.

Reference:
1. Object Oriented Programming - Robert Lafore (Galgotia Publication)
2. Object Oriented Programming - E. Balgurswami
202ME-COM Software Engineering and Software Project management


Planning a Software Project: Project Plan, guidelines for Software planning, planning tasks, CPM/PERT, Gantt chart.


UNIT 3 - Software Quality Assurance and Testing: Software quality assurance. Factors of software quality. SQA activities, s/w review basics, Documentation & issues, Verification and validation: white box and black box testing, unit testing, acceptance testing, system testing, integration testing.

Software Configuration Management: Fundamental of software configuration management (SCM) & its major elements.


UNIT 5 - Software Maintenance: Fundamental of software maintenance, types of software maintenance, strategies, and maintenance of object oriented system design.

CASE tools and Environment: Concept, scope of CASE, classification of CASE tools, categories of CASE environment.

Communication & Business technical reports: Role of communication in s/w project management & its types. Various Types of Reports according to different phases of SDLC.

Reference:

4. Project Management - "Harold Kerzner"
203MECOM - DATABASE MANAGEMENT SYSTEM

UNIT 1 - Introduction: Advantages of DBMS approach; Various views of data, data independence, schema & sub-schema; Primary concept of data models; Database languages; Transaction management; Database administration & user; Data dictionary; Overall system architecture.

ER Model: Basic concept; Design issues; Mapping constraints; Keys; ER diagram; Weak & Strong entity-sets; Specialization & generalization, aggregation, inheritance; Design of ER schema; Reduction of ER schema to tables.

Domains, Relation & Keys: Domains; Relations; Kinds of relations; Relational databases; Various types of keys; candidate, primary; alternate & foreign keys.

UNIT 2 - Relation Algebra & SQL: The structure; Relational algebra with extended operations; Modification of database; Idea of relational calculus; Basic structure of SQL; Set Operations; Aggregate functions; Null values; Nested sub queries; Derived relations; Views; Modification of database; Join relations; DDL in SQL. Database Integrity: General idea; Integrity rules; Domain rules; Attribute rules; Relation rules; Database rules; assertions, integrity & SQL.

UNIT 3 - Functional Dependencies & Normalization: Basic definitions; Trivial & nontrivial dependencies; Closure set of dependencies & of attributes; Irreducible set of dependencies; Introduction to normalization; Nonplus decomposition; FD diagram; First, second & third normal forms; Dependency preservation; BCNF; Multivalued dependencies and fourth normal form; Join dependencies and fifth normal form.

Transactions, Concurrency & Recovery: Basic concept; ACID properties; Transaction state; Implementation of atomicity & durability; Concurrent executions; Basic idea of serializability; Basic idea of concurrency control; Basic idea of deadlock; Failure classification; Storage structure-types, stable storage implementation, data access; Recovery & Atomicity- log based recovery, deferred database modification, immediate database modification, checkpoints.

Distributed Databases: Basic idea; distributed data storage; Data replication; Data fragmentation- horizontal, vertical & mixed fragmentation.

UNIT 4 - PL/SQL: Features of PL/sql; Block Structure, Variables and Types, PL/sql Types; Scalar Type definition of composite and reference type, using % type, user defined subtype, Expressions and operators, PL/sql Control structures.

SQL within PL/SQL: SQL statements, DML in PL/SQL: SELECT, INSERT, UPDATE, DELETE, WHERE, GRANT, REVOKE AND Privileges, Transaction control, COMMIT, ROLLBACK, Savepoints, Procedure, Triggers.

UNIT 5 - Storage Structure & File Organization: Overview of physical storage media; Magnetic disk performance & optimization; Basic idea of RAID; Organization of records in files; Basic concepts of indexing; Ordered indices; Basic idea of B-tree & B+ tree organization.

Network & Hierarchical Models: Basic idea; Data structure diagram; DBTG model; implementation; Tree structure diagram; Implementation techniques; Comparison of the three models.

Reference:
2. An Introduction to Database System: C.J. Date (6th Ed.) (Addison Wesley)
4. An Introduction to Database Systems: B.C. Desai (Galgota Publishers)
5. Oracle 8 – PL/SQL programming by TMH/Irman

11/23
MECOM – Visual Basic


UNIT 2: Designing a project - start up form, Properties and Program design. Managing multiple forms. Flow of control – decisions, if statement, else if clause, select case structure, nested decisions. Loops – do loops, for loops.

UNIT 3: Arrays, Declaring arrays, Multidimensional & dynamic arrays, user defined types: Recorded structures, with statement array of records.

UNIT 4: Input & Output Procedures – Defining a Menu, Control Arrays, Input Techniques – Validating & Formatting the input, Moving the focus, Menu choices out put techniques – Calculation & Display, Drawing chart.

UNIT 5: Visual Basic controls: Intrinsic controls, Custom controls, Common dialog control, Printer object, Object, Classes and Collections – Developing classes & collection MDI form, OLE controls, Data base connections. Data manager program, Data control, Bound controls.

Reference:

1. Foundation of Visual Basic - Douglas Hergert
2. Visual Basic Programming Explorer - Peter G. Altken
4. Visual Basic Programming by Content development group, Tata McGraw Hill Publication
205MECOM: MANAGERIAL ECONOMICS


References:


UNIT 2 - The medium access sublayer - ALOHA, pure aloha, slotted aloha, LAN protocols (CSMA, collision free etc.), LAN standards - comparison if Token bus, Token ring & CSMA/CD.


UNIT 4 - Internetworking - Bridges & Gateways, Remote Procedure Call (RPC), Client-server Model.

Network Security - Cryptography, Secret Key Algorithm, Public Key Algorithm, Data Encryption standard DES, Authentication protocol, Digital signatures, Secret Key signatures, Public Key signatures.

UNIT 5 - Concepts in protocol design, Network architecture & protocols, state diagrams, petrinets, flow control techniques such as centralized flow control, distributed flow control, comparision, of flow control techniques, Deadlocks such as Protocol deadlocks and Buffer deadlocks.

References:
1. Computer Networks - by Andrew S. Tanenbaum (3rd edition) - PHI publications
3. Computer Networks by Ahuja.