

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Master of Computer Application
Semester -II
Effective from: July - 2012

Paper No. : 201

Paper Title: Object Oriented Programming Methodology

1 Introduction to Object Oriented Paradigm

- 1.1 Overview of OMT
- 1.2 Types of other programming paradigm and O.O. paradigm
- 1.3 Introduction of O.O. analysis and design methods

2 Object Modeling & Design

- 2.1 Object & Classes
- 2.2 Links and Associations
- 2.3 Classification of Object
- 2.4 Aggregation & Generalization
- 2.5 UML: Introduction & Overview
 - 2.5.1 Use-cases and tasks
 - 2.5.2 Event Charts
 - 2.5.3 State Charts
 - 2.5.4 Finding use-cases
 - 2.5.5 Connecting use-case and class views
 - 2.5.6 UML notation review

3 Procedure Oriented Programming Vs. Object Oriented Programming

- 3.1 Structure & classes
- 3.2 Encapsulation & Data Hiding
- 3.3 Constructors
- 3.4 Friend Functions
- 3.5 Inline Functions
- 3.6 Dynamic Object Creation & Destruction
- 3.7 Destructors

4 Object Oriented Properties

- 4.1 Introduction to Object Oriented Properties
- 4.2 Abstraction
- 4.3 Polymorphism
 - 4.3.1 Operator Overloading
 - 4.3.2 Function Overloading & Type Conversions
- 4.4 Inheritance
 - 4.4.1 Types of Inheritance
 - 4.4.2 Constructor & Destructor calls during Inheritance
- 4.5 Dynamic Polymorphism
 - 4.5.1 Overriding
 - 4.5.2 Virtual Functions
 - 4.5.3 Abstract Class

5 Data Files

- 5.1 Streams
- 5.2 File Types and Modes
- 5.3 File Pointers & their manipulations
- 5.4 Sequential Input & Output operations
- 5.5 Random access
- 5.6 Error handling during File operations

6 Exception Handling

7 Self Study

Generic Programming

- 7.1 Template Classes & Function

Reference Books

1. The C++ Programming Language, Stroustrup, Addison Wesley
2. The Complete Reference C++, Schildt, Tata McGraw Hill
3. OOP in Turbo C++, Robert Lafore, Galgotia Publication
4. C++ Primer, Lippman, Addison Wesley
5. Object Oriented Programming with ANSI and Turbo C++, Kamthane, Pearson Education
6. Thinking in C++, Bruce Eckel, Pearson
7. Object Oriented Modelling & Design, Rumbaugh, PHI
8. Object Oriented Analysis & Design with Application, Grady Booch, LPE
9. Standard C++ with Object Oriented Programming, Paul S. Wang, Thomson
10. Object Oriented Design, Peter Coad, Prentice Hall
11. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modelling Language User Guide, Pearson Education.
12. Programming with ANSI C++, Bhushan Trivedi, Oxford University Press

Note: 5% weight may be given to self study topic in the final exams

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Paper No. : 202
Paper Title : Data Structures

1. Non-Primitive Data structures.

- 1.1 Arrays - its storage structures & operations
- 1.2 Stacks - operations and its applications in Recursion, Polish expressions etc.
- 1.3 Queues - Types of queues, operations and its applications.
- 1.4 Linked lists - Types of linked list, operations and its applications.
- 1.5 Trees - Concept and Definitions, Operations, linked & threaded storage representation of Binary Trees.
- 1.6 Applications of Trees - The manipulation of Arithmetic expressions, Syntax Analysis etc.

2. Analysis of Algorithms

- 2.1 Asymptotic: Big-O and Theta

3. Basic techniques & example algorithms for

- 3.1 Divide & Conquer method
- 3.2 Greedy method
- 3.3 Backtracking
- 3.4 Branch & Bound

4. Searching:

- 4.1 Sequential, Binary
- 4.2 Search Trees:- Height, Balanced tree, 2-3, tree, red-black trees weight-balanced trees

5. Hashing

- 5.1 Hash Tables
- 5.2 Hash functions
 - 5.2.1 Division method
 - 5.2.2 Multiplication method

6. Sorting

- 6.1 Internal sorting - Insertion, Selection, Quick, 2-way merge and Heap
- 6.2 External sorting - k-way merging, Balanced merge and poly phase merge

7. [Self Study]

- Graphs – Creation and Traversal

Reference Books:

1. An Introduction to Data Structures with applications - Trembley - McGraw Hill
2. Theory and Problems of Data Structure – Lipschutz Semour – McGraw-Hill
3. Algorithms + Data Structure Programs - Wirth, Niclaus - PHI.
4. Fundamentals of Data Structures, Horwitz, E. and Sahni S. - Computer Science Press.
5. The Art of Computer Programming, Vols. 1-2, Knuth D. - Addison-Wesley.
6. Data Structures and Algorithms - Aho A.V., Hopcroft and Ullman - Addison-Wesley.
7. Data Structure & "C" Programming - Vanwyte C J - Addison Wesley.
8. Data Structures, Algorithms And Object Oriented Programming – Tata McGraw Hill edition Geogory L. Heileman.
9. Data Structures and the Standard Template Library - William J. Collins, Tata McGraw Hill edition.
10. Programming with C++ and Data Structures - Maria Litvin & Gary Litvin, Vikas Publishing House Pvt. Ltd.
11. Data Structures using C & C++ - Y. Langsam Moshe J. Angensterin & A.M. Terenbanm
12. Data Structures and Algorithms in C++ - Adam Drozdek, Thomson Learning
13. Data Structures & Program Design in C - Robert Kruse, C.L. Tondo, Brnce leing PHI Pvt Ltd.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
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Paper No. : 203

Paper Title : Relational Data Base Management System

1. Storage and File Structure.

- 1.1 Overview of Physical Storage Media
- 1.2 Magnetic Disks
- 1.3 RAID
- 1.4 File Organization
- 1.5 Organization of records in File
- 1.6 Data – Dictionary

2. Indexing and Hashing

- 2.1 Ordered Indices
- 2.2 B⁺ Tree Index Files
- 2.3 B- Tree Index Files
- 2.4 Static Hashing
- 2.5 Dynamic Hashing
- 2.6 Comparison of Ordered Indexing and Hashing
- 2.7 Index Definition in SQL
- 2.8 Multiple – Key Access

3. Database System Architectures

- 3.1 Centralized Systems
- 3.2 Client – Server Systems
- 3.3 Parallel Systems
- 3.4 Distributed Systems
- 3.5 Network Types

4. Crash Recovery

- 4.1 Failure classification
- 4.2 The storage hierarchy
- 4.3 Transaction model
- 4.4 Log-based recovery
- 4.5 Buffer management
- 4.6 Checkpoints
- 4.7 Shadow Paging

5. Security and Integrity

- 5.1 Security and integrity violations
- 5.2 Authorization and views
- 5.3 Security specification in SQL
- 5.4 Encryption

6. Query Processing

- 6.1 Query interpretation
- 6.2 Equivalence of expressions
- 6.3 Estimation of Query-processing cost
- 6.4 Join Strategies
- 6.5 Structure of the query optimizer

7. Concurrency Control

- 7.1 Schedules
- 7.2 Testing for serializability
- 7.3 Lock-based protocols
- 7.4 Timestamp-based protocols
- 7.5 Validation techniques

8. [Self Study]

A case study on Distributed Database System Architecture.

Reference Books:

1. Database System Concepts - Henry F. Korth & Abraham Silberschatz - TMH
2. Principles of Database Systems - Jeffery Ullman - Galgotia Publication
3. An introduction to Database Systems - C.J.Date - Addison- Wesley
4. Introduction to Database Management - Navin Prakash – TMH
5. Introduction to Database System - Bipin C. Desai – Galgotia
6. Manual of RDBMS.

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Paper No. : 204

Paper Title : Optimization Techniques

1. Linear Programming

- 1.1 Formulation of L.P.P.
- 1.2 Solution Methods
 - 1.2.1 Graphical Method
 - 1.2.2 Simplex Method
 - 1.2.3 Two Phase Method
 - 1.2.4 Big-M Method

2. Special cases of L.P.P.

- 2.1 Transportation Problem
- 2.2 Assignment Problem

3. Job Sequencing

- 3.1 Processing n jobs through 2 machines
- 3.2 Processing n jobs through 3 machines
- 3.3 Processing 2 jobs through m machines
- 3.4 Processing n jobs through m machines

4. Inventory Problem

- 4.1 Introduction to Inventory
- 4.2 Deterministic Inventory models
- 4.3 Dynamic Inventory models

5. Network Analysis

- 5.1 PERT
- 5.2 CPM

6. Self Study

Practical of PERT CPM

Reference Books:

1. Hiller F.S. & Liberman G.J.: Introduction to Operations Research 2nd Edn.: - Holand Day Inc. London, 1974
2. Tara H.A.: Operation Research, 3rd Edn.- McMillan Publishing Company, 1982
3. Beightler C.S. & Phillips D.T.: Foundations of Optimization,- Prentice Hall, 1979
4. McMillan claude Jr.: Mathematical Programming, 2nd Edn.- Wiley Series, 1979
5. Gillett B.G.: Introduction to Operation Research - A Computer oriented Algorithmic approach- McGraw Hill Book Comp., 1976
6. N.S. Kambo: Mathematical Programming Techniques

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Paper No. : 205

Paper Title : Computer Network

1 Introduction

- 1.1 Introduction to networks, Internet and its application
- 1.2 Network Structure
- 1.3 Network Architecture
- 1.4 The OSI Reference model & services
- 1.5 The TCP/IP Reference model and Comparison with OSI Model

2 Physical Layer

- 2.1 Concepts of data transmission
 - 2.1.1 Guided and unguided Transmission media. PSTN
- 2.2 Multiplexing & switching technique
- 2.3 ISDN (Integrated Service Digital Network)

3 MAC Sub layer

- 3.1 Multiple Access Protocols
- 3.2 Ethernet
- 3.3 LAN protocols & IEEE standards for LAN
- 3.4 Fibre Optic & Satellite networks

4 Data Link Layer

- 4.1 Data Link Layer protocols
- 4.2 Error detection & correction

5 Network Layer

- 5.1 Routing Algorithm
- 5.2 Congestion Control Algorithm
- 5.3 Internetworking

6 Transport Layer

- 6.1 Connection Management

7 Concepts of Session Layer

8 The Presentation Layer

- 8.1 Data Compression Technique
- 8.2 Cryptography
- 8.3 Symmetric Key Algorithms
- 8.4 Public – Key Algorithms & management of Public Keys
- 8.5 Digital Signatures and Communications security

9 The Application Layer

- 9.1 Electronic Mail
- 9.2 Virtual Terminals
- 9.3 General Purpose Applications

10 [Self Study]

Virtual LAN

Reference Books:

1. Networking Complete- 1st Edition 2002, BPB Publication (Text Book)
2. Data Communication and Networking: Forouzan, TMH
3. Computer Networks - A. S. Tanenbaum - Prentice-Hall
4. Computer Networks and Distributed Processing - Martin J. - Pretice-Hall
5. Local Area Networks: An Introduction - Stalling, William - Mc-Millan Publishing Co.
6. Computer Networks: Protocols, Standards and Interfaces - Black - Prentice-Hall
7. Data Networks: Concepts Theory and Practices - Black - PHI
8. NW Architecture - Comer - Prentice-Hall

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VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
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Paper No. : 206
Paper Title : Programming Skills-II

Practical based on paper no: 201 (C++)

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Paper No. : 207
Paper Title : Programming Skills-III

Practical based on Paper No: 202 (Data Structures)

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Paper No. : 208

Paper Title : Programming Skills-IV

Practical based on Paper No: 205 (Implementation or simulation of Network Algorithms & Protocols using C or C++)