

# VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.C.A.  
Semester - III

Effective from :July 2004  
Proposed Teaching and Evaluation Scheme

Paper No	Title	Teaching			University Exam		Internal Marks	Total Marks
		Theory	Practical	Tutorial	Duration (Hrs)	Marks		
301	Client Server Architecture	3	-	1	3	70	30	100
302	Operating Systems	3	-	1	3	70	30	100
303	Software Engineering – I	3	-	1	3	70	30	100
304	Object Oriented Programming Methodology	3	-	1	3	70	30	100
305	Interactive Computer Graphics	3	-	1	3	70	30	100
306	Practicals	-	10	-	5	100	50	150

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## M.C.A. Semester - III

### Paper 301 : Client Server Architecture

1. Client/Server computing model.
  - 1.1 Evolution of Client/Server Computing Model
  - 1.2 Functions of Clients, Functions of Servers and Application Portioning
  - 1.3 Layered Architectures
  - 1.4 Communication between clients and servers and middleware components
  
2. Overview of Oracle Architecture.
  
3. Oracle Tools and Utilities
  - 3.1 SQL
  - 3.2 PL/SQL Procedural Extension.
    - 3.2.1 Package Creation
    - 3.2.2 Packaged Procedure
    - 3.2.3 Creating Packaged Subprogram
    - 3.2.4 Cursors
    - 3.2.5 Stored Procedures
    - 3.2.6 Database triggers
  
  - 3.3 SQL \* Plus
  - 3.4 SQL DBA
  - 3.5 SQL \*Loader
  - 3.6 Import & Export
  
4. Database Administration
  - 4.1 Managing the Database
    - 4.1.1 Parameter file
    - 4.1.2 Oracle SID
    - 4.1.3 Creating the new Database
    - 4.1.4 Startup and shutdown
    - 4.1.5 Data Dictionary
    - 4.1.6 Redo logs
    - 4.1.7 Control files
    - 4.1.8 Trace and alert files
    - 4.1.9 Database Modes
    - 4.1.10 Useful data dictionary views
  
  - 4.2 Managing disk Space
    - 4.2.1 Blocks in Database file
    - 4.2.2 Segments and Extents
    - 4.2.3 ROWID
    - 4.2.4 Storage clause
    - 4.2.5 Rollback Segments
    - 4.2.6 Table Spaces
    - 4.2.7 Data Partitioning

- 4.3 Managing Users
  - 4.3.1 User Authentication Methods
    - 4.3.2.1 Password Authentication
    - 4.3.2.2 O.S Authentication
  - 4.3.2 User Configuration Setup
    - 4.3.2.1 Profiles
    - 4.3.2.2 Default Tablespace
    - 4.3.2.3 Temporary Tablespace
  - 4.3.3 Resource Management
    - 4.3.3.1 Using Profiler
    - 4.3.3.2 Quotas
  - 4.3.4 Working with user database account
    - 4.3.4.1 Creating, Modifying and deleting user account
    - 4.3.4.2 Changing password
  
- 4.4 Backup & Recovery
  - 4.4.1 Types of Backup
    - 4.4.1.1 Control file, Redo log file, cold and liot backup
  - 4.4.2 Tablespace offline failures
  - 4.4.3 Types of Database failures
  - 4.4.4 Recovery Methods
    - 4.4.4.1 Cold Restor, full Database Recovery, Time based recovery
  
- 4.5 Database Security
  - 4.5.1 Authentication
  - 4.5.2 Privileged Accounts
  - 4.5.3 Object Security
  - 4.5.4 System security
  - 4.5.5 Database Roles
  - 4.5.6 Database Auditing
  
- 5. Advanced Topics
  - 5.1 Oracle Pre compilers
  - 5.2 Parallel Processing
  - 5.3 Introduction to Grid-Based Database

Reference Books :

1. George Koch: The complete reference – Oracle Press
2. Richard J Niemiec : Oracle Performance Tuning- Tips & Techniques Oracle press
3. Oracle 8 PL/SQL Programming – oracle press
4. Venkat S Devraj : Oracle 24 x 7 Tips & Techniques – Oracle Press
5. David C Kreines : Oracle SQL The Essential Reference – O Reilly
6. Oracle 8i/9i - The Complete Reference -Oracle Press - TMH Publication
7. Oracle 8 Architecture - Borbowaski - TMH Publication

# VEER NARMAD SOUTH GUJARAT UNIVERSITY

M.C.A.  
Semester - III

## Paper : 302 : Operating System

1. Memory Management
  - 1.1 Memory Management Functions
  - 1.2 Contiguous Allocation
    - 1.2.1 Partitioned Memory & Static and Dynamic Allocation
    - 1.2.2 Segmentation
  - 1.3 Non-Contiguous Allocation
    - 1.3.1 Paging and Segmentation
    - 1.3.2 Demand Paging and Segmentation
    - 1.3.3 Allocation and Replacement Policies
- 2 Process Management
  - 2.1 Process Management Functions
  - 2.2 Process Concepts
  - 2.3 Threads
  - 2.4 Scheduling
  - 2.5 Scheduling Algorithms
  - 2.6 Process Coordination
    - 2.6.1 Inter Producer Communication
    - 2.6.2 Critical Section Problem
      - 2.6.2.1 Semaphores
      - 2.6.2.2 Monitors
    - 2.6.3 Deadlocks
- 3 Device Management
  - 3.1 Device Management Functions
  - 3.2 Device Characteristics
  - 3.3 Disk Space Management
  - 3.4 Allocation and Disk Scheduling Methods
  - 3.5 Swap Space Management
- 4 File Management
  - 4.1 File Management Functioning
  - 4.2 File System and Directory Structure Organization
  - 4.3 File sharing and Protection
- 5 Distributed Operating Systems
  - 5.1 Introduction and Concepts
- 6 Network Operating Systems
  - 6.1 Introduction and Concepts

Case studies of appropriate Operating System may be carried out.

Reference Books:

1. An Operating System Concepts , Silberschatz, Addison Wesley
2. Operating Systems, W. Stallings, prentice all India
3. Understanding Operating Systems, T.M. Flynn, A.M. Mchoes, Thomson Learning
4. Operating System Concepts and Design, Milenkevic M., McGraw Hill
5. Operating Systems, Donovan M. McGraw Hill
6. Operating Systems, A. S. Godbole, Tata McGrah Hill

# VEER NARMAD SOUTH GUJARAT UNIVERSITY

## M.C.A. Semester - III

### Paper No. : 303 : Software Engineering

1. Software : The product
  - 1.1 The role of software
  - 1.2 Problems & causes associated with software development
  - 1.3 Software, Characteristics, Components, Applications, Myths
2. Software Process
  - 2.1 SE – technology layers
  - 2.2 Generic view
  - 2.3 Software process models
    - 2.3.1 The linear sequential model
    - 2.3.2 The prototyping model
    - 2.3.3 Evolutionary process models: Incremental, Spiral
    - 2.3.4 Introduction to Formal methods model, 4GT
3. Requirement analysis : concept & principles
  - 3.1 Analysis tasks
  - 3.2 Fact-finding techniques
  - 3.3 Principles
  - 3.4 Software Requirements specification
  - 3.5 Specification review
4. Analysis modeling
  - 4.1 The elements of the analysis model
  - 4.2 Functional modeling & information flow
  - 4.3 Data Dictionary
  - 4.4 Introduction to behavior modeling
5. Software design concepts and principles
  - 5.1 Introduction
  - 5.2 Design principles
  - 5.3 Design concepts
  - 5.4 Effective modular design
  - 5.5 Design Heuristics
  - 5.6 Design Documentation
6. Design Methods
  - 6.1 Data design
  - 6.2 Architectural design
  - 6.3 Procedural design
  - 6.4 Interface design
7. Object oriented analysis & design
  - 7.1 Overview of O. O. concepts
  - 7.2 Object oriented application development paradigm
  - 7.3 Introduction to O O analysis and design methods
8. Object oriented analysis
  - 8.1 Use case analysis
  - 8.2 Application architecture
  - 8.3 Use of prototypes in analysis

- 8.4 Class responsibilities collaborators
- 8.5 Activity modeling
- 8.6 Component building
- 9. Object oriented design
  - 9.1 Component design
  - 9.2 Specifying dialogs
  - 9.3 Identifying domain classes and relationships
  - 9.4 Domain class modeling
  - 9.5 Delimiting components
  - 9.6 Specifying operations , attributes
  - 9.7 Modeling of activities, object interaction

Case studies may be carried out at appropriate stage of the course.

Reference Books :

1. R.S.Pressman : Software Engineering –A Practitioner’s approach –Mcgraw Hill.
2. James A Senn : Analysis and design of information systems McGraw Hill
3. Richard Fairley : System Analysis & Design – Galgotia Pub.
4. Stephen R Schach : Software engineering with java – TMH
5. Pankaj Jalote. An integrated approach to software engineering – Narosa
6. Developing software with UML ( OO analysis & design in practice)- Bernd Oestereich
7. System analysis & design in changing world- Satzinger, Jackson, Burd ( Thmpson learning)

# **VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

## **M.C.A. Semester - III**

### **Paper : 304 : Object Oriented Programming Methodology**

1. Procedure Oriented Programming Vs. Object Oriented Programming
2. Classes and Objects
3. Encapsulation and Data Hiding
4. Constructors and Destructors
5. Polymorphism
  - 5.1 Operator Overloading
  - 5.2 Functional Overloading
- 6 Inheritance
- 7 Dynamic Polymorphism
- 8 Data Files in C++
- 9 Templates
- 10 Class Library OSL and Window Programming

#### 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

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## M.C.A. Semester - III

### Paper : 305 : Interactive Computer Graphics

1. Introduction to Computer Graphics
  - 1.1 Image Processing as Picture Analysis
  - 1.2 Advantages of Computer Graphics
  - 1.3 Applications of Computer Graphics
  - 1.4 Basic Input and Output Technology used in Interactive Computer Graphics
  - 1.5 Graphics Standards
  
- 2 Basic Raster Graphics Algorithms
  - 2.1 Frame Buffers and Display Controllers
  - 2.2 The output pipeline
  - 2.3 Scan Converting Lines
    - 2.3.1 Incremental Algorithm
    - 2.3.2 Midpoint Line Algorithm
  - 2.4 Scan Converting Circles
    - 2.4.1 Eight-Way Symmetry
    - 2.4.2 Midpoint Circle Algorithm
  - 2.5 Scan Converting Ellipses
  
- 3 Polygons
  - 3.1 Polygons and its representation
  - 3.2 Inside Tests
  - 3.3 Filling polygons
    - 3.3.1 Flood Fill
    - 3.3.2 Scan Line Fill
  - 3.4 Filling Ellipse Arcs
  - 3.5 Pattern Filling
  - 3.6 Thick Primitives
  - 3.7 Line Styles and Pen Styles
  - 3.8 Character Generation
  
- 4 Windowing and Clipping
  - 4.1 Definition of Windowing and Clipping
  - 4.2 Clipping Lines
    - 4.2.1 Line clipping by Solving Simultaneous Equations
    - 4.2.2 Cohen – Sutherland Line Clipping Algorithm
  - 4.3 Clipping Circles and Ellipses
  - 4.4 Clipping Polygons
    - 4.4.1 Sutherland Hodgman Polygon Clipping Algorithm
  
- 5 Display Devices
  - 5.1 Hardcopy Display Devices
  - 5.2 Display Technology
  - 5.3 Raster-Scan Display
  - 5.4 Video Controller
  - 5.5 Image Scanners

- 6 Transformations
  - 6.1 2D Transformations
  - 6.2 Homogeneous Coordinated
  - 6.3 Composite 2D Transformation
  - 6.4 The Viewing Transformation
  - 6.5 Matrix representation of 3D Transformations
  - 6.6 Composite 3D Transformations
  - 6.7 Transformation as a change in Coordinate System
- 7 Viewing in 3D
  - 7.1 Projections
  - 7.2 Specifying an Arbitrary 3D View
  - 7.3 3D Views
- 8 Geometric Modeling
  - 8.1 Introduction
  - 8.2 Characteristics and retained mode Graphics Packages
  - 8.3 Defining and Displaying Structures
- 9 Introduction to Illumination, and Shading
- 10 Image Manipulation and Storage
  - 10.1 Introduction to Image
  - 10.2 Filtering
  - 10.3 Image Processing
  - 10.4 Image Composition
  - 10.5 Image Storage
  - 10.6 Special Effects with Image
- 11 Animation
  - 11.1 Design of Animation Sequences
  - 11.2 Key Frame Systems
    - 11.2.1 Morphing
    - 11.2.2 Simulating Acceleration
  - 11.3 Motion Specifications
    - 11.3.1 Direct Motion Specification
    - 11.3.2 Goal Directed Systems

### **Reference Books**

1. Computer Graphics : Principles & Practice Second Ed. in C, Foley, Van Dam, Feiner, Hughes, Pearson Education, Eleventh Indian Reprint. 2004
2. Computer Graphics C Version, Donald Hearn & M. Pauline Baker, Pearson Education, Fifth Indian Reprint 2004
3. Computer Graphics, Herrington S. Prentice Hall
4. Principles of Interactive Graphics, Newman & Sproul , McGraw Hill
5. Interactive Computer Graphics, Giloi W.K. Prentice Hall

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Semester - III**

**Paper : 306 : Practical**

Practical shall be based on paper no 301 to 305.