Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 301-Client Server Architecture

Objective: To acquaint the students with Client Server Architecture and PL/SQL programming
Prerequisites: Basic DBMS concepts

1. Database Computing Model

1.1 Client Server Computing: Functions of client, server, middle ware components.
1.2 Advantages and limitations of client server computing
1.3 Three Tier Architecture: Overview of thin client, application server, web server.
1.4 Overview of Distributed Database
1.5 Overview of Real Application Clusters
1.6 Overview of High Performance Database Computing
1.7 Overview of Data Warehousing and Data Mining

2. Overview of Oracle Database Server Architecture

2.1 Architecture of Oracle Database and Oracle Instance
2.2 Overview of Physical and Logical Structures
2.3 Dedicated and Shared Server Configuration
2.4 Oracle Server Startup and Shutdown
2.5 Creating Database

3. Oracle Tools and Utilities

3.1 SQL
3.2 Pl/SQL Procedural Extension.
3.2.1 Overview, PL/SQL data types & Control Structures
3.2.1 Cursors
3.2.2 Stored Procedures & Functions
3.2.3 Database Triggers
3.2.4 Package Creation
3.2.5 Dynamic SQL
3.2.6 Collections & Objects

4. Database Administration

4.1 Managing Users
4.1.1 User Authentication Methods
4.1.1.1 Password Authentication
4.1.2.2 O.S Authentication
4.1.2 User Configuration Setup
4.1.2.1 Profiles
4.1.2.2 Default Table space
4.1.2.3 Temporary Table space

4.1.3 Resource Management
4.1.3.1 Quotas
4.1.4 Working with user database account
4.1.4.1 Creating, Modifying and deleting user account
4.1.4.2 Changing password

4.2 Backup & Recovery
4.2.1 Types of Backup
4.2.1.1 Control file, Redo log file, cold and hot backup
4.2.2 Types of Database failures
4.2.3 Recovery Methods
4.2.3.1 Cold Restore, full Database Recovery, Time based recovery

4.3 Database Security
4.3.1 Authentication
4.3.2 Privileged Accounts & Privileges
4.3.3 Object Security
4.3.4 System security
4.3.5 Database Roles
4.3.6 Database Auditing

5. Self Study:

Export & Import Tools, Overview of Grid Based Database Computing, Calling External Routines from PL/SQL

References:

1	Oracle 9i PL/SQL Programming	Scott Urman	Oracle Press
2	Oracle DBA Fundamentals-I	-	Oracle Press
3	Effective PL/SQL	-	Apress
4	Expert Oracle Database Architecture 9i and 10g	Tom Kyte	Apress
5	Effective Oracle By Design	Tom Kyte	Oracle Press
6	Oracle 24 X 7 Tips and Techniques	Venkat Devraj	Oracle Press
7	Expert Oracle Database 11g Administration	Alpati	Wiley Student Edition
8	Fundamentals of Database Management System	Gilleneon	Wiley Student Edition
9	SQL & PL/SQL for Oracle 11g Black Book	Deshpande	Wiley Student Edition
10	Beginning Oracle Database 11g Administration from novoice to professional	Iggy Fernandez	Apress/Springer
11	Oracle PL/SQL	Example, Benjamin Rosenweig & Elena Silvestrova	4/e,Pearson
12	Database Systems Using Oracle: A simplified guide to SQL & PL/SQL	Shah Nilesh	PHI
13	Learning Oracle SQL & PL/SQL: A Simplified Guide	Chatterjee, Rajeeb C	PHI

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 302-Operating System

Objective: Conceptualize the students with the theoretical concepts of Operating System
Prerequisites: Fundamentals of Computer Organization and Operating System

1. Operating System Concepts

- 1.1 History of Operating Systems
- 1.2 Operating System Structure: Layered System, Microkernel and Virtual Machine
- 1.3 System Calls

2. Process & Multi-processing

- 2.1 Process Concept
- 2.2 Process State Transition Model
- 2.3 Process Scheduling
  - 2.3.1 Scheduling Criteria
  - 2.3.2 Scheduling Algorithms
  - 2.3.3 Context Switching
- 2.4. Thread & Multithreading

3. Process Coordination

- 3.1 Inter-process Communication
- 3.2 Process Synchronization
  - 3.2.1 The Critical-Section Problem
  - 3.2.2 Peterson's Algorithm
  - 3.2.3 Semaphore
  - 3.2.4 Classic Problems of Synchronization
- 3.3 Deadlock
  - 3.3.1 Deadlock Characteristics
  - 3.3.2 Deadlock Avoidance
  - 3.3.3 Deadlock Prevention
  - 3.3.4 Deadlock Detection & Recovery

4. Memory Management

- 4.1 The notion of Physical and Logical Address Space
- 4.2 Binding and Binding Times
- 4.3 Contiguous Allocation & Non-Contiguous Allocation
  - 4.3.1 Paging
  - 4.3.2 Memory Mapping with Paging
- 4.4 Structure of Page Table
- 4.5 Segmentation
- 4.6 Other Memory Management Schemes: Swapping and Overlays

4.7 Demand Paging & Demand Segmentation
- 4.7.1 Allocation of Frames
- 4.7.2 Page Replacement policies
- 4.7.3 Thrashing and other issues

5. File System
- 5.1 File Concept: File Types and File Operation
- 5.2 Directory Structure
- 5.3 Directory Implementation
- 5.4 File-System Implementation
- 5.5 Allocation Methods
- 5.6 Free-Space Management
- 5.7 File-System Mounting
- 5.8 File Sharing and Protection
- 5.9 Log-Structured File-System

6. Device Management
- 6.1 I/O Hardware
- 6.2 Application l/O Interface
- 6.3 Kernel I/O Subsystem
- 6.4 Mass Storage Structure
  - 6.4.1 Disk Structure
  - 6.4.2 Disk scheduling
  - 6.4.3 Disk Management

7. Protection & Security
- 7.1 Protection
  - 7.1.1 Goals of Protection
  - 7.1.2 Domain of Protection
- 7.2 Security Problem
  - 7.2.1 User Authentication
  - 7.2.2 Cryptography as Security Tool
  - 7.2.3 Program Threats
  - 7.2.4 System and Network threats
  - 7.2.5 Implementing Security Defenses

8. Introduction to Network and Distributed O.S
Self Study: Introduction to FreeBSD and Windows Server 2008

References:

1	Operating System Principles by Abraham Silberschatz	Peter Baer Galvin, and Greg Gagne	Wiley India
2	Operating Systems: A Concept-based Approach	Dhamdhere	TMH
3	Modern Operating Systems	Andrew S. Tanenbaum	Pearson Edu./PHI
4	Operating Systems	Achyut Godbole	TMH
5	Distributed Operating Systems	Tanenbaum, Pearson	-
6	Unix Concepts and Application	Das	McGrawHill

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper No.: 303- Software Engineering

Objective: Understand the Project Management Concepts and learn Software Engineering Concepts in depth
Prerequisites: Basic Software Development Skills.

1. Introduction
- 1.1 Role of Software
- 1.2 What is software?
- 1.3 Software characteristics
- 1.4 Software Engineering: definition
- 1.5 Process models
  - 1.5.1 Waterfall Model
  - 1.5.2 Prototyping
  - 1.5.3 Incremental models
  - 1.5.4 Spiral model

2. Requirement Engineering and Requirement analysis modeling
- 2.1 Requirement engineering tasks
- 2.2 Introduction to requirement Inception, Elicitation, Elaboration, Negotiation, Specification, Validation, Management
- 2.3 Requirement analysis
- 2.4 Elements of analysis model and modeling approaches
- 2.5 Data Flow oriented modeling
- 2.6 Software requirement specification

3. Design engineering
- 3.1 Translation of analysis model into the design model
- 3.2 Design process and design quality
- 3.3 Design concepts
- 3.4 Design model
- 3.5 Concept of Pattern based software design
- 3.6 Introduction: Architecture design
- 3.7 Mapping data flow into software architecture
- 3.8 User interface design: golden rules

4. Software Testing
- 4.1 Testing fundamentals
  - 4.1.1 Principles
  - 4.1.2 Test characteristics
- 4.2 White box testing
  - 4.2.1 Basis path testing
  - 4.2.2 Control structure testing
- 4.3 Black box testing
  - 4.3.1 Equivalence partitioning
  - 4.3.2 Boundary value analysis

- 4.4 Software Testing Strategies
  - 4.4.1 Unit testing
  - 4.4.2 Integration testing
  - 4.4.3 Validation testing
  - 4.4.4 System testing

5. Software Project management

- 5.1 People
  - 5.1.1 Stack holders
  - 5.1.2 Team leaders
  - 5.1.3 Software team
  - 5.1.4 Agile teams
- 5.2 Product
  - 5.2.1 Software scope
  - 5.2.2 Problem decomposition
- 5.3 Process
  - 5.3.1 Process decomposition
- 5.4 Project
  - 5.4.1 Issues, approaches
- 5.5 W5HH principle

6. Process and project metrics

- 6.1 Measures, metrics and indicators
- 6.2 Process metrics and process improvement
- 6.3 Project metrics
- 6.4 Size oriented metrics
- 6.5 Function oriented metrics
- 6.6 Metrics for software quality
- 6.7 Integrating metrics within the software process

7. Estimation

- 7.1 Software project estimation
- 7.2 Decomposition techniques
- 7.3 Problem based estimation
- 7.4 LOC based estimation
- 7.5 FP based estimation
- 7.6 Process based estimation
- 7.7 Empirical estimation models

8. Project Scheduling

- 8.1 Basic concepts
- 8.2 Basic principles
- 8.3 Relationship between people and effort
- 8.4 Effort distribution
- 8.5 Task network
- 8.6 Scheduling and tracking
- 8.7 Earned value analysis

9. Risk Management

9.1 Strategies
9.2 Software risks
9.3 Risk identification, assessment, components, drivers
9.4 Risk projection
9.5 Risk mitigation, monitoring and management

10. Quality Management

10.1 Quality concepts
10.2 Software quality assurance
10.3 SQA activities
10.4 Formal technical reviews
10.5 Statistical software quality assurance
10.6 Software reliability

Self study and Practice:

Test Case Generation and Testing using Testing Tool
SRS and case studies should be carried out.

References:

1	Software Engineering – A Practitioner's approach	R.S. Pressman	McGraw Hill
2	software engineering principles and practice	Javadekar	Tata McGraw Hill
3	Software engineering	Ian Somerville	Addition Wesley / pearson education
4	Fundamentals of software engineering, 3rd edition	Rajib Mall	PHI
5	An integrated approach to software engineering,3rd Edition	Pankaj Jalote	Narosa
6	Software engineering with java	Stephan R. Schach	TMH

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 304-Programming in .NET

Objective: To familiarize the students with .NET technology and in-depth programming in VB.Net

Prerequisites: Programming skills and Object Oriented Programming Methodology

1. Overview of Microsoft .NET Framework

1.1 The .NET Framework
1.2 The Common Language Runtime (CLR)
1.3 The .NET Framework class Library
1.4 .NET Web Services

2. Visual Basic .NET programming

2.1 Working with Tool box controls
2.2 Working with Menus and Dialog Boxes
2.3 Tapping Errors Using Structured Error Handling
2.4 Using Modules and Procedures
2.5 Using Arrays and Collections

3. Object Oriented Programming

3.1 Creating Classes, Object Construction & Destruction
3.2 Class Libraries : DLL's & Static Classes
3.3 Abstraction, Encapsulation & Polymorphism
3.4 Interfaces & Inheritance
3.5 Object Serialization

4. Multithreading, Files & Streams

5. Database access using ADO.NET

5.1 Visual Database Tools
5.2 ADO.NET Object Model
5.3 ADO.NET Programming
5.4 Working With DataSets
5.5 Integration with XML
5.6 The Middle Tier

6. Introducing ASP.NET

6.1 Overview of ASP.NET
6.2 Building Web Forms
6.3 Maintaining State in Web Applications
6.4 Caching & Configuration
6.5 Accessing Databases from ASP.NET

Self Study :

The Web Data Controls
Working with Web Services

References:

1	Moving to VB.NET: Strategies, Concepts, and Code	Dan Appleman	-
2	Microsoft Visual Basic .NET Step By Step	Michael Halvorson	PHI
3	Database Programming with Visual Basic .NET and ADO.NET	F. Scott Barker	Sams Publishing
4	Beginning .NET Web Services Using Visual Basic .NET	Joe Bustos and Karlli Watson	Wrox Publication
5	.NET – Complete Development Cycle	G. Lenz, T. Moeller	Pearson Education
6	Professional VB.NET, 2nd Edition	Fred Barwell	et al - Wrox Publication
7	Mastering Visual Basic .NET Database Programming	Bilgin	BPB Publication
8	Visual Basic 2008 Programming Black Book Beginners Ed.	Kogent	Wiley
9	Pro VB 2008 and the .Net 3.5 Platform,	Andrew Troelsen	Apress
10	Microsoft Visual Basic 2008 Step By Step	Michael Halvorson	Microsoft Press

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 305-Java Programming

Objective: Learn Core Java Programming
Prerequisites: Programming skills and Object Oriented Programming Methodology

1. Introduction of Java Language
- 1.1 Features of Java
- 1.2 Java Developer's Kit: Java Compiler, Java Interpreter, Java Debugger, Applet Viewer
- 1.3 Working with IDE
- 1.4 JVM & Bytecode

2. Java Language Fundamentals
- 2.1 Primitive and Non-Primitive Data types
- 2.2 Variable and Reference variable
- 2.3 Operators & Expressions
- 2.4 Flow control statements
- 2.5 Working with Arrays & String

3. Object Oriented Programming
- 3.1 Classes and Objects
  - 3.1.1 Fields & Methods
  - 3.1.2 Object Creation, Construction and Initialization
  - 3.1.3 Method and Constructor Overloading
- 3.2 Inheritance
  - 3.2.1 Extending Class
  - 3.2.2 Role of Constructors in inheritance
  - 3.2.3 Inheriting and redefining members
  - 3.2.4 Type computability and conversion
  - 3.2.5 'This' & 'Super' Keyword
- 3.3 Interfaces
  - 3.3.1 Abstract class & Interfaces
  - 3.3.2 Defining & Extending Interfaces
  - 3.3.3 Implementing Interfaces
- 3.4 Packages
  - 3.4.1 Package Naming
  - 3.4.2 Package Access

4. Exception Handling
- 4.1 Exception & Types of Exception
- 4.2 Use of try, catch, finally, throw, throws in Exception Handling
- 4.3 Control Flow in Exceptions
- 4.4 Creating User Defined Exceptions

5. Threads

- 5.1 Creating Threads
  - 5.1.1 Extending Thread class
  - 5.1.2 Implementing Runnable interface
- 5.2 Thread scheduling
- 5.3 Thread Synchronizing
  - 5.3.1 Use of 'synchronized' keyword
  - 5.3.2 wait, notify and notifyall methods
- 5.4 'volatile' modifier

6. Garbage Collection and Memory

- 6.1 Garbage Collection
- 6.2 Finalization
- 6.3 Interacting with Garbage Collector
- 6.4 Reachability States and Reference Objects

7. The I/O Package

- 7.1 Overview of Streams
- 7.2 Bytes vs. Characters Streams
- 7.3 Converting Byte Streams to Character Streams
- 7.4 Basic and Filtered Streams
- 7.5 File Object
- 7.6 Reading and Writing to Files
- 7.7 Object Serialization

8. GUI Programming

- 8.1 Abstract Window Toolkit (AWT) Class
  - 8.1.1 Components and Containers
  - 8.1.2 Layout Managers
  - 8.1.3 Classes for various controls: Labels, Buttons, Text Fields, Text Areas, Check Boxes and Choice List, etc...
- 8.2 Event Handling
  - 8.2.1 Event Types & Classes
  - 8.2.2 The Delegation Model of Event Handling: Event Classes, Event Sources & Event Listeners
  - 8.2.3 Adapter Classes

9. Applets

- 9.1 Introduction to Applets
- 9.2 Applet Life Cycle Methods

10. Networking & Socket

- 10.1 URL Manipulation
- 10.2 InetAddress Class
- 10.3 Socket Overview:
  - 10.3.1 TCP and UDP Socket
  - 10.3.2 Introduction of Java Classes: ServerSocket, Socket, DatagramSocket & DatagramPacket
  - 10.3.3 Client Server Interaction with Stream Socket Connection
  - 10.3.4 Datagrams: connectionless Client/Server Interaction

11 Overview of Java Database Connectivity

11.1 JDBC Drivers

11.2 Making a Connection with Database

11.3 Basis for Processing SQL Statements

- 11.3.1 Creating Statements: PreparedStatement
- 11.3.2 Executing Queries
- 11.3.3 Processing ResultSet Objects

Self Study :

EJB - Overview

References:

1	Java Programming Language	James Gosling, David Holmes Arnold	Addition Wesley
2	Java – The Complete Reference	Patrick Naughton	Tata McGraw Hill
3	Experiments with Java: An Introductory Lab Manuals	S.A. Robelsky	Addition Wesley
4	Java 2 From Scratch	Stevens Halmes	PHI
5	Java: how to program, 9th Edition	Paul Deitel,Harvey Deitel	PHI
6	Complete Reference	Peter Naughten	Tata McGraw Hill

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 306-Programming Skills V

Practical based on paper no 301.
Separate journals to be prepared for this subject 306.

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 307- Programming Skills VI

Practical based on paper no 304.
Separate journals to be prepared for this subject 307.

Veer Narmad South Gujarat University, Surat
M.C.A (3rd Semester)
Syllabus Effective from: July 2013
Paper: 308- Programming Skills VII

Practical based on paper no 305.
Separate journals to be prepared for this subject 308.