VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 501/ Subject: Cloud Computing

Effective From: June, 2014

Credits	4	Total Hrs:	4

Objective:	To provide comprehensive and in-depth knowledge of Cloud Computing Concepts, technologies, architecture, applications and implementations.
Prerequisite:	Web Services, DBMS concepts, Networking

1. Introduction
   - 1.1 Grid Computing
   - 1.2 Cluster Computing
   - 1.3 Cloud Computing (NIST Model)
     - 1.3.1 Evolution
     - 1.3.2 History, Properties, characteristics & Disadvantages

2. Cloud Computing Architecture
   - 2.1 Cloud Computing Stack
     - 2.1.1 Comparison with traditional architecture
   - 2.2 Service Models
     - 2.2.1 Infrastructure as a Service (IaaS)
     - 2.2.2 Platform as a Service (PaaS)
     - 2.2.3 Software as a Service (SaaS)
   - 2.3 Deployment Models
     - 2.3.1 Public Cloud
     - 2.3.2 Private Cloud
     - 2.3.3 Hybrid Cloud
     - 2.3.4 Community Cloud

3. Infrastructure as a Service (IaaS)
   - 3.1 Introduction to Virtualization
     - 3.1.1 Hypervisors, Machine Image, Virtual Machine
   - 3.2 Resource Virtualization
     - 3.2.1 Server, Storage, Network
   - 3.3 Amazon EC
   - 3.4 Eucalyptus

4. Platform as a Service (PaaS)
   - 4.1 Introduction to Service Oriented Architecture (SOA)
   - 4.2 Cloud Platform
     - 4.2.1 Computation
     - 4.2.2 Storage
   - 4.3 Microsoft Azure
   - 4.4 SalesForce.com's Force.com

5. Software as a Service (SaaS)
   - 5.1 Web Services
   - 5.2 Web OS

6. Cloud Security
   - 6.1 Infrastructure Security
   - 6.2 Data Security and Storage
   - 6.3 Identity & Access Management
   - 6.4 Access Control
   - 6.5 Authentication in Cloud

7. Cloud Databases (DbaaS)
   - 7.1 Amazon SimpleDB & RDS
   - 7.2 Azure Table Service & SQL Azure
   - 7.3 BigTable
   - 7.4 Oracle Cloud

References:

1	Cloud Computing Principles and Paradigms	Rajkumar Buyya, James Broberg, Andrzej M. Goscinski	Wiley, 2011
2	Cloud Computing : Principles, Systems and Applications	Nikos Antonopoulos, Lee Gillam	Springer 2012
3	Enterprise Cloud Computing : Technology, Architecture, Applications	Gautam Shroff	Cambridge University Press 2010
4.	Cloud and Virtual Data Storage Networking	Greg Schulz	Auerbach, 2011
5.	Cloud Security : A Comprehensive Guide to Secure Cloud Computing	Ronald L Krutz, Russel Dean Vines	John Wiley & Sons, 2010
6.	Cloud Computing Bible	Barrie Sosinsky	Wiley India, 2011
7.	Cloud Computing	David Crookes	TMH Education 2012
8.	Cloud Computing : Implementation, Management and Security	James F RAnsome, John W Rittinghouse	CRC Press, 2009
9.	Amazon Cloud Computing with Java	Aditya Yadav	Lulu.com, 2010
10.	Grid and Cloud Database Management	Fiore, SAndro, Aloisio, Giovanni	Springer, 2010
11.	Building a Database Cloud for Dummies	Michael Wessler	John Wiley & Sons, 2012

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 502 / Subject: Artificial Intelligence and Knowledge Based Systems

Effective From: June, 2014

Credits	4	Total Hrs:	4

Objective:	To acquaint students with concepts of Artificial Intelligence and its applications.
Prerequisite:	Data Structures, Information Systems

1. Introduction to Artificial Intelligence
   - 1.1. What is AI
   - 1.2. Applications of AI
   - 1.3. Introduction to Expert System
   - 1.4. Applications of expert systems

2. Knowledge Overview
   - 2.1. Definition and importance of knowledge
   - 2.2. Overview knowledge representation
   - 2.3. Overview of knowledge organization
   - 2.4. Overview of knowledge Manipulation
   - 2.5. Overview of Knowledge Acquisition

3. Representation and Search
   - 3.1. Structured Knowledge
     - 3.1.1. Associative networks
     - 3.1.2. Frame structures
     - 3.1.3. Conceptual dependencies and scripts
   - 3.2. Object oriented representation

4. Organization and Manipulation
   - 4.1. Introduction to organization
   - 4.2. Search techniques
     - 4.2.1. Uninformed search
     - 4.2.2. Informed search
     - 4.3. Introduction to matching Techniques

5. Knowledge Acquisition
   - 5.1. Knowledge learning types
   - 5.2. General learning models
   - 5.3. Performance of learning models

6. Expert System
   - 6.1. Advantages of Expert Systems
   - 6.2. Characteristics of Expert Systems

6.3. Design of Expert Systems
- 6.3.1. Selecting Problem
- 6.3.2. Stages in Expert systems development
- 6.3.3. Errors in developments
- 6.3.4. Expert System Software Engineering
- 6.3.5. Expert System Life Cycle

References:

1	Introduction to Artificial Intelligence and Expert System	Dan W. Patterson	PHI (1999)
2	Artificial Intelligence – A Modern Approach (2nd Edition 2004)	Stuart J. Russell and Peter Norvig	Pearson Education
3	Artificial Intelligence Structures and Strategies for Complex Problem Solving (4th Edition 2004)	George F. Luger	Pearson Education
4	Foundation of Artificial Intelligence and Expert Systems	V.S. Janakiraman, K. Sarukesi, P. Gopalakrishnan	Mc Millan (2002)
5	Expert Systems Principles and Programming (3rd Edition)	Giarratano & Riley	Thomson (Vikas Pulishing House)
6	Introduction to Artificial Intelligence	Rajendra Akerkar	PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 503 / Subject: ERP using SAP

Effective From: June , 2014

Credits	4	Total Hrs:	4

Objective:	To acquaint with ERP concepts and its programming
Prerequisite:	Programming concepts, DBMS

1 Introduction
- 1.1 Introduction to ERP
- 1.2 Introduction to SAP
- 1.3 Example: How SAP works in an Organiation

2 Architecture of SAP Application Server
- 2.1 3-Tier Architecture
- 2.2 Application Servers
- 2.3 Work processes and its Type

3 Data Dictionary & Data Structures in ABAP
- 3.1 Introduction to Data dictionary
- 3.2 Different Types of Data structures
- 3.3 Internal Tables and its operation

4 Modularisaton Techniques
- 4.1 Include Programs
- 4.2 Subroutines
- 4.3 Function Module.
- 4.4 Types of Function Module(Simple, RFC enabled, BAPI)

5 List Report, ALV Report
- 5.1 Simple List Report
- 5.2 Interactive List Report
- 5.3 Events in List Reports
- 5.4 Field catalog generation in ALV
- 5.5 Operation on ALV(Sorting, Filtering, Totals, Subtotals, Download, Hide Columns)

6 Module pool programming / Screen Programming
- 6.1 Screen Elements(Simple & Complex)
- 6.2 Screen Events(PBO/PAI)
- 6.3 Transactions

7 Selection-Screen programming
- 7.1 Defining Selection Screen.

7.2 User ACtions on Selection Screen.
7.3 Events of Selection Screen

8 Smartform/Sapscript
8.1 Form printing with smartform
8.2 Form printing with Sapscript

9 BDC & LSMW
9.1 Data upload through BDC
9.2 Data upload through LSMW

10 Enhancement(Exits & BADI)
10.1 What is Enhancement
10.2 User-Exits
10.3 BADI(Business Add-in)

References:

1	ABAP Cookbook	James Wood	
2	BC - ABAP Programming from SAP-AG		
3	Teach Yourself ABAP/4 in 21 Days	Ken Greenwood	SAMS
4	SAP Smart Forms	Christoph Wachter, Werner Hertleif	
5	SAPscript	Michaelson Buchanan	
6	Developing Sap's R/3 Application with Abap/4		
7	Data Migration Made Easy - R/3 Simplications Group	SAP Labs	
8	ABAP Development for SAP NetWeaver BW: Exits, BAdIs, and Enhancements	Dirk Herzog	
9	Next Generation ABAP Development (2nd Edition)	Rich Heilman and Thomas Jung	

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 504 / Subject: Advanced Database Administration

Effective From: June, 2014

Credits	**4**	**Total Hrs:**	**4**

Objective:	**To learn advanced database administration, database tuning and maintenance**
Prerequisite:	**RDBMS**

1. Oracle11g Instance creation and management
   - 1.1 Oracle Instance
   - 1.2 Installing Oracle
   - 1.3 Oracle Optimal Flexible Architecture (OFA)
   - 1.4 Locating initialization, listener.ora & sqlnet.ora files
   - 1.5 Finding the alert log
   - 1.6 Common environment variables
   - 1.7 Structures in an Oracle Instance
   - 1.8 Oracle Memory Structures, SGA and PGA
   - 1.9 Oracle Processes and their purposes
   - 1.10 Startup nomount, mount and open database commands
2. Oracle11g Database Architecture
   - 2.1 Oracle11g management framework
   - 2.1 Using the Database Creation Assistant (DBA)
   - 2.3 Creating and dropping a database
   - 2.4 Tablespaces
   - 2.5 Tables and Indexes
   - 2.6 Clusters
   - 2.7 Partitioning of Tables and Indexes
   - 2.8 Gathering and applying patches
3. Concurrency Management
   - 3.1 Transactions, serialization, locks and latches
   - 3.2 Lock modes
   - 3.3 Detecting and resolving lock conflicts
   - 3.4 Managing deadlocks
4. Interfacing with Oracle
   - 4.1 Oracle transaction management
   - 4.2 Using SQL*Plus and iSQL*Plus
   - 4.3 Using embedded Oracle with Pro*C & Java
   - 4.4 PL/SQL & Triggers
   - 4.5 Pining PL/SQL packages & compiling PL/SQL
   - 4.6 System-level triggers – startup trigger, logon trigger, PL/SQL error trigger
5. Oracle*Net
   - 5.1 Basic Network structure

- 5.2 Oracle*Net Files
- 5.3 Multi-threaded server
- 5.4 Create additional listeners
- 5.5 Create Oracle Net service aliases
- 5.6 Configure connect time failover
- 5.7 Oracle*Net names resolution

6. Tablespace Management Overview
   - 6.1 Dictionary Managed Tablespaces
   - 6.2 Locally Managed Tablespaces
   - 6.3 Automatic Segment Space Management
   - 6.4 Moving tablespaces online and offline
7. UNDO Tablespace Management
   - 7.1 Use of undo segments
   - 7.2 Creating an undo tablespace
   - 7.3 User managed undo tablespaces
   - 7.4 Automatic undo management
   - 7.5 Monitor & Configure undo retention
   - 7.6 Use the Undo Advisor
   - 7.7 Size the undo tablespace
8. Oracle Utilities
   - 8.1 Datapump - Import/export
   - 8.2 SQL*Loader
   - 8.3 Oracle Streams
   - 8.4 Automatic Database Diagnostic Monitor
   - 8.5 Automatic Tuning Optimizer
   - 8.6 Automatic Shared Memory Tuning
9. Oracle Performance Tuning
   - 9.1 Locate invalid and unusable objects
   - 9.2 Gather SQL optimizer statistics with dbms_stats
   - 9.3 Basic Oracle performance metrics
   - 9.4 Use OEM and dbms_alert to set warning and critical alert thresholds
   - 9.5 The SQL Tuning Advisor
   - 9.6 The SQL Access Advisor
   - 9.6 Interpreting server generated alerts
   - 9.7 Oracle advisory utilities vdb_cache_advice, vshared_pool_advice v$pga_aggregate_target_advice
   - 9.8 Using OEM performance screens
   - 9.9 Fixing performance issues
10. User Management
    - 10.1 Creating Users
    - 10.2 Altering users
    - 10.3 User Profiles
    - 10.4 User resource groups
    - 10.5 Granting privileges & roles
    - 10.6 Auditing user activity with dbms_audit
11. Oracle Security
    - 11.1 Password use in Oracle
      Password encryption and password aging
      External authentication
      Using Single sign-on (SSO)
    - 11.2 Object security
    - 11.3 Virtual Private Databases (VPD) in Oracle
    - 11.4 Oracle “grant execute” security

- 11.5 Use of Roles in Oracle
- 11.6 Register for security updates

12. Backup & Recovery
    - 12.1 Oracle backup & recovery planning
    - 12.2 Parallel instance recovery
    - 12.3 Basics of checkpoints, redo log files, and archived log files
    - 12.4 Using ARCHIVELOG mode
    - 12.5 Creating consistent Oracle backups
    - 12.6 Online hot backups
    - 12.7 Incremental Oracle backups
    - 12.8 Automating database backups with dbms_scheduler
    - 12.9 Monitor the flash recovery area
    - 12.10 Recovering from loss of a Control file
    - 12.11 Recovering from loss of a Redo log file
    - 12.12 Recovering from loss of a system-critical data file
    - 12.13 Recovering from loss of a non system-critical data file
13. Introduction to Oracle 12c

References:

1.	Pro Oracle Database 12c Administration	Darl Kuhn	Apress
2.	Beginning Oracle Database 11g Administration : From Novice to Professional	Ignatius Fernandez	Apress
3.	Oracle Database 11g DBA handbook	Bob Bryla, Kevin Loney	Oracle Press
4.	Expert Oracle Database 11g Administration	Sam R Alapati	Dreamtech Press
5.	OCA : Oracle Database 11g Administrator Certified Associate Study Guide	Biju Thomas	Sybex
6.	Essentials : Oracle Database 10g	Rick Greenwald, Robert Stackowiak, Jonathan Stern	O'Reilly
7.	Oracle High Performance Tuning for 9i and 10g	Gavin Powell	Digital Press
8.	Oracle Database 10g, DBA Handbook	Loney, Kevin, Bryla, Bob	Oracle Press
9.	Oracle Database 10g The Complete Reference	Loney, Kevin	Oracle Press
10.	Oracle Database 10g: A Beginner's Guide	Micheal Abbey, Ian Abramson	Osborne Oracle Press Series

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 505 / Subject: Data ware Housing and Data mining

Effective From: June , 2014

Credits	**4**	**Total Hrs:**	**4**

Objective:	**To understand data mining concepts and methods and to be able to apply them in practice.**
Prerequisite:	**RDBMS, Basics of statistics**

1 Data warehouse: Introduction
- 1.1 Data Warehouse characteristics
- 1.2 Data Marts
- 1.3 OLTP and OLAP systems
- 1.4 Star, Snowflakes, and Fact Constellations Schemas for Multi-dimensional Databases
- 1.5 OLAP Operations in the Multidimensional data model
- 1.6 Type of OLAP servers

2 Developing Data Warehouse
- 2.1 Building a Data Warehouse
- 2.2 Three-Tier Data Warehouse Architecture
- 2.3 Metadata Repository

3 Data Pre-processing
- 3.1 Descriptive Data Summarization: central tendency, disperation of data
- 3.2 Data Cleaning : missing values, noisy data
- 3.3 Data Integration & Transformation
- 3.4 Data Reduction: Attribute selection
- 3.5 Data Discretization & Concept Hierarchy Generation

4 Data Mining: Introduction
- 4.1 Knowledge discovery and Data Mining.
- 4.2 Basic Introduction to Data Mining Functionalities:
  - 4.2.1 Concept/Class Description Characterization & Discrimination
  - 4.2.2 Mining Frequent Patterns, Associations, and Correlations
  - 4.2.3 Classification & Prediction
  - 4.3.4 Cluster Analysis
  - 4.2.5 Outlier Analysis
  - 4.2.6 Evolution analysis

5 Mining Frequent Patterns, Associations, and Correlations
- 5.1 Basic concepts: Frequent Itemsets & Closed Itemsets, Association Rules
- 5.2 The Apriory algorithm: Finding Frequent Itemsets Using Candidate Generation
- 5.3 FP-growth: Finding Frequent Itemsets without Candidate Generation
- 5.4 Generating Association Rules from Frequent Itemsets
- 5.5 Introduction to multilevel and multidimensional Association rules

6 Classification & Prediction
- 6.1 Introduction to Classification & Prediction?
- 6.2 Prediction: Linear Regression, Nonlinear Regression
- 6.3 Decision Tree Algorithm
  - 6.3.1 Decision Tree Induction
  - 6.3.2 Attribute Selection Measures- Information Gain and Gain Ratio
  - 6.3.3 Tree Pruning
- 6.4 Bayesian Classification
  - 6.4.1 Bayes' Theorem
  - 6.4.2 Naïve Bayesian Classification
- 6.5 Accuracy and Error Measures for classification

7 Cluster Analysis
- 7.1 Classification vs. clustering
- 7.2 What is Partitioning & Hierarchical Clustering Methods
- 7.3 Classical Partitioning Methods: k-Means

8 Application and Trends in Data Mining

References:

1	Data Mining: Concepts & Techniques	Han & Kamber	Morgan Kaufmann Publishers
2	Data Mining Introductory and Advanced Topics	Dunha	Pearson
3	Data Warehouse Toolkit	R. Kinball	,John Wiley & Sons
4	Data Warehouses and OLAP: Concepts, Architectures, and Solutions	Robert Wrembel, Christian Koncilia	IGI
5	Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management	Gordon S. Linoff, Michael J. A. Berry	Wiley
6	Data Preparation for Data Mining	Dorian Pyle	Morgan Kaufmann Publishers
7	Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals	Paulraj Ponniah	Wiley
8	Data Warehousing: Concepts, Techniques, Products and Applications	C.S.R. Prabhu	PHI Learning
9	Advanced Data Mining Techniques	David Louis Olson, Dursun Delen	Springer

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 506/ Subject: Programming Skills XI

Effective From: June, 2014

Practical based on paper no 501.
Separate journal to be prepared for this subject 501.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 507/ Subject: Programming Skills XII

Effective From: June, 2014

Practical based on paper no 503.
Separate journal to be prepared for this subject 503.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 508/ Subject: Programming Skills XIII

Effective From: June, 2014

Practical based on paper no 504.
Separate journal to be prepared for this subject 504.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 509/ Subject: Programming Skills XIV

Effective From: June, 2014

Practical based on paper no 505.
Separate journal to be prepared for this subject 505.