

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 501/ Subject: Cloud Computing

Effective From: June, 2014

Credits	4	Total Hrs:	4
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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
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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 (2 nd Edition 2004)	Stuart J. Russell and Peter Norvig	Pearson Education
3	Artificial Intelligence Structures and Strategies for Complex Problem Solving (4 th 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 (3 rd Edition)	Giarratano & Riley	Thomson (Vikas Publishing House)
6	Introduction to Artificial Intelligence	Rajendra Akerkar	PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 503 / Subject: Network Essentials and its Security

Effective From: June , 2014

Credits	4	Total Hrs:	4
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Objective:	To understand network management and its security
Prerequisite:	Computer Network, TCP/IP

- 1 Networking Essentials
 - 1.1 Repeaters & Bridges
 - 1.1.1 LAN expansion
 - 1.1.2 Repeaters
 - 1.1.3 Bridges
 - 1.1.4 How Bridges work
 - 1.1.5 Creating the routing table
 - 1.1.6 Segmenting network traffic
 - 1.1.7 Remote bridges
 - 1.1.8 Differentiating between bridges and repeaters
 - 1.2 Routers & Gateways
 - 1.2.1 Routers
 - 1.2.2 How routers work
 - 1.2.3 Routing benefits
 - 1.2.4 Routing protocols
 - 1.2.5 Routing V/s Bridging
 - 1.2.6 Brouters
 - 1.2.7 Gateways
 - 1.2.8 How Gateways work
 - 1.3 Network Administration
 - 1.3.1 Bottlenecks
 - 1.3.2 Simple Network Management Protocol
 - 1.3.3 Data Protection
 - 1.3.4 Backup Methods
 - 1.3.5 Testing & storage
 - 1.3.6 Implementing a backup System
 - 1.3.7 Uninterruptible power supplies
 - 1.3.8 How Gateways work
 - 1.3.9 Implementing fault tolerant systems
 - 1.3.9 RAID
 - 1.3.9 Sector Sparing
 - 1.4 Advance WAN Transmission
 - 1.4.1 Overview
 - 1.4.2 Multiplexing, packet and circuit switching networks
 - 1.4.3 X.25
 - 1.4.4 Asynchronous Transfer Mode (ATM)
 - 1.4.5 ISDN
 - 1.4.6 SONET

1.4.7. SMDS

- 2 Introduction to network security
- 3 Cryptography Techniques
 - 3.1. Classical cryptography
 - 3.2. Conventional cryptography
 - 3.2.1. DES
 - 3.3. Public-key cryptography
 - 3.3.1. RSA
 - 3.4. Digital signatures
 - 3.4.1. DSA
- 4 Security services
 - 4.1. Message integrity
 - 4.2. Confidentiality and authentication
 - 4.3. Certification and key management
 - 4.3.1. PKI
- 5 Network security applications
 - 5.1. IP security
 - 5.1.1. IPsec
 - 5.2. Web security
 - 5.2.1. SSL, TLS, SET
 - 5.3. Electronic mail security
 - 5.3.1. PGP, S/MIME)
 - 5.4. SNMP security
- 6 Access control in computer networks
 - 6.1. authentication protocols and services
 - 6.1.1. Kerberos and X.509
 - 6.2. Firewalls
 - 6.3. Virtual Private Networks (VPNs).
- 7 System security
 - 7.1. Intrusion detection
 - 7.2. Viruses
- 8 Mobile system & E-commerce securities
 - 8.1. 3G security
 - 8.2. e-payment systems
 - 8.3. fair data exchange

References:

1. Cryptography and Network Security, 2/e, ISBN: 0-13-869017-0 W. Stallings Pearson Education, 1999
2. Network Security Essentials: Applications and Standards, 1/e, ISBN: 0-13-016093-8 W. Stallings Pearson Education, 2000
3. SSL and TLS: designing and building secure systems, ISBN: 0-201-61598-3 E. Rescorla Addison-Wesley, 2001
4. Implementing Secure Intranets and Extranets, ISBN: 0-89006-447-4 K M Phaltankar Artech House Publishers, 2000
5. Secure Electronic Commerce: Building the Infrastructure for Digital Signature and Encryption, ISBN: 0-13-027276-0 W. Ford, and M. Baum Prentice Hall, 2001
6. Security in Computing, ISBN: 0-13-185794-0, 2/e C. P. Pfleeger Prentice Hall, 1997
7. Building Internet Firewalls, 2/e, ISBN: 1-56592-871-7 E. D. Zwicky, et al O'Reilly, 2000
8. CDMA Cellular Mobile Communications & Network Security, ISBN: 0-13-598418-1 M. Y. Rhee, Prentice Hall, 1998
9. Journal of Computer Security
10. ACM Transactions on Information and System Security
11. ACM Conference on Computer and Communications Security
12. IEEE Symposium on Security and Privacy
13. Internet documents - RFCs (Request for Comments)
14. Guide to Networking Essentials, Fourth Edition
15. Computer Networking Essentials Greg Tomsho, et al Debra Littlejohn Shinder Microsoft Corporation (Corporate Author) A. S. Tanenbaum
16. Networking Essentials: Hands-On, Self-Paced Training for Supporting Local and Wide Area Networks
17. Computer Network

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 504 / Subject: Network Administration

Effective From: June , 2014

Credits	4	Total Hrs:	4
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Objective:	To understand network administration
Prerequisite:	Computer Network, TCP/IP

- 1 Networking and TCP/IP on Linux
 - 1.1. Fundamentals of Linux Networking
 - 1.2. Fundamentals of TCP/IP on the Linux Operating System
 - 1.3. Advanced Linux TCP/IP Concepts
 - 1.4. Introduction to Dial-up Technologies

- 2 Dynamic Host Configuration Protocol
 - 2.1. Introduction to BOOTP and DHCP
 - 2.2. Installing and Examining a Linux DHCP server
 - 2.3. Examining Additional DHCP Options and Configurations

- 3 Domain Name System
 - 3.1. Introduction to the Domain Name System
 - 3.2. Installing and Configuring DNS

- 4 The Network File System
 - 4.1. Introduction to the Network File System
 - 4.2. Configuring NFS

- 5 Linux Remote Administration
 - 5.1. Introduction to Remote Administration
 - 5.2. The Telnet Protocol
 - 5.3. The open secure Shell protocol

- 6 The Cron Daemon
 - 6.1. Introduction to Automation
 - 6.2. Configuring the Cron Daemon

- 7 Samba
 - 7.1. Introduction to Samba
 - 7.2. Cross-Platform Connectivity
 - 7.3. Installing and Configuring Samba

- 8 Linux System-Wide Logging
 - 8.1. Introduction to System-wide Logging
 - 8.2. Configuring System-Logging

- 9 The Network Information Service

- 9.1. Introduction to NIS
- 9.2. Setting Up and Configuring an NIS server

References:

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|-----|--|---|-----------------------|
| 1. | TCP/IP Network Administration | Craig Hunt | O'Reilly & Associates |
| 2. | Managing NFS and NIS | Hal Stern | O'Reilly & Associates |
| 3. | DNS and BIND | Albitz/Liu | O'Reilly & Associates |
| 4. | Sendmail | Bryan Costales/Eric Allman/Neil Rickert | O'Reilly & Associates |
| 5. | UNIX System Administration Handbook - Second Edition | Nemeth/Snyder/Seebass | Prentice Hall |
| 6. | Red Hat Linux Networking and System Administration | Terry Collings, Kurt Wall | |
| 7. | Red Hat Linux 9 Bible | Christopher Negus | |
| 8. | Official Red Hat Linux User's Guide | Red Hat Inc. | |
| 9. | Official Red Hat Linux Administrator's Guide | Red Hat Inc. | |
| 10. | Red Hat Linux Security and Optimization | Mohammad J. Kabir | |

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

MCA (5th Semester)

Paper: 505 / Subject: Wireless Network & Mobile Computing

Effective From: June , 2014

Credits	4	Total Hrs:	4
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Objective:	To understand wireless network technologies and mobile networks and computing
Prerequisite:	Computer Network

- 1 Introduction to Wireless Network
 - 1.1. Introduction
 - 1.2. Standards
 - 1.3. Emerging Technologies

- 2 Introduction to Networking Technologies
 - 2.1. OSI Basics
 - 2.2. LAN Basics
 - 2.3. LAN & WAN Protocols
 - 2.4. Internet Protocol

- 3 Wireless LAN Technologies
 - 3.1. Frequency Hopping Spread Spectrum
 - 3.2. Direct Sequence Spread Spectrum (DSSS)
 - 3.3. Interference
 - 3.4. RF Math
 - 3.5. Service Sets
 - 3.6. Mobile IP
 - 3.7. Appropriate use and design of wireless Networking

- 4 Implementation
 - 4.1. Multipath
 - 4.2. Co-location
 - 4.3. Power Variance Options
 - 4.4. Power-over-Ethernet (PoE)
 - 4.5. Earth Bulge
 - 4.6. Fresnel Zone
 - 4.7. Weather
 - 4.8. Line of Site (LOS)

- 5 Physical and Mac Layers
 - 5.1. Modulation & Bit coding
 - 5.2. Fragmentation
 - 5.3. SIFS / PIFS / DIFS / EIFS

- 6 Hardware configuration and implementation
 - 6.1. Access Points
 - 6.2. Bridges
 - 6.3. Workgroup bridges
 - 6.4. Wireless Residential Gateways
 - 6.5. Host Connectivity
 - 6.6. Antennas, Cables, & Connectors

- 7 Wireless LAN Security
 - 7.1. Filtering
 - 7.2. Advanced Encryption Standard (AES)
 - 7.3. Wired Equivalent Privacy (WEP)
 - 7.4. Risks

- 8 Introduction to Mobile Computing and Personal Communications Services
 - 8.1. Mobility, Nomadic, Mobile and Ubiquitous computing
 - 8.2. Mobile Computing Architecture
 - 8.3. Mobile Computing Technologies (Hardware, Software, Communication)
 - 8.4. PCS Architecture, Mobility Management, Network Signaling

- 9 GSM System Overview
 - 9.1. Introduction
 - 9.2. GSM Architecture, Mobility Management, Network Signaling

- 10 GPRS
 - 10.1. Architecture
 - 10.2. Network Nodes

- 11 WAP
 - 11.1. Mobile Internet Standards, WAP Gateway and Protocols
 - 11.2. WML

- 12 3G Mobile Services
 - 12.1. Introduction to International Mobile Telecommunications
 - 12.2. WCDMA
 - 12.3. Quality Services of 3G Technology

- 13 Introduction to WLL, Virtual Networks, Bluetooth, IR, Bluetooth Protocols

References:

1. Wireless Local Area Network Fundamentals
Pejman Roshan,
Jonathan Leary
2. Wireless Networks First Step (First-step series)
Jim Geier
3. 802.11 wireless network site surveying and
installation
Bruce Alexander
4. Cisco Wireless LAN Security
Krishna Sankar
5. The Book of Wi-Fi : Install, Configure, and use
802.11b Wireless Networking
John Ross
6. Wi-Fi Security
Stewart Miller
7. Wireless and Mobile Network
Architecture Yi- John Wiely & Sons,
Bing Lin & Imrich 2001
Chlamtac
8. Mobile and Personal Communication systems and
services
Raj Pandya PHI 2001
9. Guide to Designing and Implementing wireless
LANs
Mark Ciampa Thomson learning ,
Vikas Publishing
House, 2001
10. Wireless Web Development
Ray Rischapter Springer
publishing, 2000

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

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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.