Tilak Maharashtra Vidyapeeth, Pune

Department Of Computer Science

Syllabus of Master Of Computer Management (MCA)

SEMESTER – III

Subject: Advance Computer Network (MCA – 331)

1. Introduction to Computer Networks

Basic Hardware Architecture, Network Topologies, Types of Media & Devices, Transmission Technique , Twisted Pair, Coaxial Cable, Fiber optics, Wireless Transmission Switching, Circuit Switching, Message Switching, Packet Switching

2. Basic Networks Architecture

Connection oriented N/Ws, Connectionless N/Ws, Example of N/Ws-P2P, X.25, ATM, Ethernet, WLANs - 802.11, 802.11x, Gigabit, Wi-Max, Bluetooth Technology.

3. Types of Network

LAN: Components & Technology, Access Technique, Transmission Protocol & Media. WAN, MAN.

BBN (Broad Band Network): Integrated Service Digital Networks (ISDN), Broad Band ISDN,

ATM, ATM Traffic Mgmt, Introduction to very small Aperture Terminal (VSAT)

4. OSI Reference Model & IP

OSI Ref. Model, TCP/IP Model, OSI vs. TCP/IP Model..

What is IP? What IP does? IP addresses, Network & Host IP, Broadcast IP, Subnet, Address Classes, Loop back address, IP routing concepts, outing Tables, Stream & Packets, What TCP does?. Sliding Windows, TCP – a reliable pipe, TCP connection – Multiple conversations, Port Numbers, Multiple Connection from many hosts and one host, IPv4 VS IPv6.

5. Domain Network Services (DNS)

Domain Names, Authoritative Hosts, Delegating Authority, Resource Records, SOA records, DNS protocol, DHCP & Scope Resolution.

6. Types of Protocol

HTTP communications - HTTP request, Request Headers, Responses, Status Code, Error Status Code, Email- Sending & Receiving Emails, Email Addressing, Message Structure,

MIME, SMTP with examples, Mail Exchangers – Delivering a message, Mail Boxes, POP, IMAP, FTP, Telnet, Proxy Server, Proxy Web Servers

7. SNMP Technologies

An IP Management Protocol, Network Management protocols, SNMP the Simple Network Management Protocol, Agents & Managers, SNMP organization, Object Identifiers, Problem with SNMP

8. Network Securities

IDS & IPS, Types of firewalls, Setting Fire wall policies and rules, Honeypots, Common Problem with Packet Filtering, SSL, IPSec, VPN, Cryptography.

Reference Books:

1) Computer Networks - Abndrew S. Tanenbaum 4e

2) Network Essential Notes - GSW MCSE Study Notes

3) Internetworking Technology Handbook - CISCO System

4) Introduction to Networking and Data Communications - Eugene Blanchard

5) Computer Networks and Internets with Internet Applications - Douglas E. Comer

6) Firewalls and Internet Security - William R. Cheswick

7) Computer Networking, Addison - Wesley, J. F. Kurose, K. W. Ross.

8) Data Networks, 2nd edition or later - W. Stallings,

9) Data and Computer Communications, Prentice Hall, Sixth Edition, 2000, or later, Dimitri Bertsekas and Robert Gallager,

Subject: Oracle (MCA – 332)

1. Introduction to RDBMS

- What is RDBMS?
- Difference between DBMS & RDBMS

2. SQL(Structured query language)

- Data Definition Language
- Creating Tables, Inserting values into Table, Updating Columns of Table
- Deleting Rows from Table, Dropping a Column
- Maintaining Database Object

 Alter Table, Commit & Rollback Operators In, Between, and, Or, Not, Distinct, Sub query, Where, Like, Having and order by clauses.

 Aggregate Functions, Grouping the Result of Query

 Views, Sequence, Index

3. Querying Multiple Tables

 Joins (Equi joins, Cartesian joins, Outer joins, Self joins)

 Procedures & Functions

4. PL/SQL

 Architecture, Fundamentals of PL/SQL, PL/SQL Data Types

 Variables and Constants, Operator Precedence, Built-in-Functions

 Conditional & Iterative Control, Cursor management in PL/SQL

 Explicit Cursor, Implicit Cursor

 Exceptional Handling in PL/SQL

5. Triggers

 Creating Triggers

 Working with Abstract Data Types

6. ORACLE 9i

 Reports

 OOPs with Oracle

Reference Books:

1. Power Builders Vedas – Prasad Bodepudi

2. SQL, PLSQL By Ivan Bayross

3. Oracle By Tyan K. Stehems

Subject :Core Java(MCA – 333)

1. The Genesis of Java

Creation of Java, Why it is important to Internet, characteristics of Java

2. Basics of Programming

Data types and variables, Arrays operators Types casting and conversion Condition & looping constructs Clauses and methods Overloading Inheritance

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3. Packages & Interfaces

Defining Packages, Understanding & catch class path Access protection, Importing Packages, interfaces

4. Exception Handling

Exception types ,Using try & catch, Nested try, Using throw , throws finally Built in Exception, Creating & using own Exception ,Subclasses

5. String Handling

String constructions, String operations, Standard String methods

6. I/O

Streams, byte Streams, Char Streams, Reading console I/P, Writing Console O/P file I/O, sterilization

7. Apple Programming Apple

basics, Simple display methods, repainting passing parameters

8. Event Handling and User Interface

Event Classes, Sources of Events, Event listeners

AWT classes Windows fundamentals, Component-window, Container-frame

Panel –canvas Checkbox, group list scrollbar

Graphics Text field, text area

Colors Menus dialogs.

Fonts AWT-controls-layout manager

Labels

Buttons

Subject : Internet Programming (HTML, Java script/XML)(MCA-334)

HTML BASICS

1) Definition of HTML

Markup language, hypertext etc, html tags-tag syntax. Structure of html document- head section and body section. Block level elements

2) Text level elements

Font tag, base font tag, big and small tags, bold italic and underline tags, the strike, teletype and BR tag, subscript and superscript tags, the quote tag. Heading tag and attributes, paragraph tag, center and block quote tags, hr tag the

3) Order Unordered List

preformatted tag lists-ordered and unordered lists, definition lists. Images and colors. Background images and colors and their attributes.

4) Hyperlinks & table tag.

Anchor tag, h ref, title attribute, Table element, TR, TD, TH tags, caption elements, attributes of the table tag.

5) Frames forms.

Creating frames-vertical, horizontal and grid of frames, attributes of the frameset element, frame tag and its attributes, linking frames. The form tag-attributes- action, method the input elements and its types- text password checkboxes, radio buttons, submit and reset buttons, select tag, text area tag.

JavaScript:

1) Introduction to JavaScript:

Origins of JavaScript, JavaScript Characteristics, Common Programming Concepts, Java and JavaScript, Server – side Vs Client – side Application, Annotating Code with Comments.

2) Working with Variables and data:

Communicating with user, Using Data More Than Once: Variables, Keywords and Reserved Words, Expressions, Operators, Inline Scripting, Simple User Events, and the onLoad and onUnload Event Handlers, Functions, Methods, and Events, Function, Methods as Functions, Defining a Function, Calling a Function, user Events and JavaScript Event Handlers**.**

3) Controlling Program Flow:

The if...else statement, The while statement, the for statement, the break statement, The continue statement, the switch statement**.** The do... while Statement: The JavaScript Object Model

4) The JavaScript object

Hierarchy Model, Commonly Used Objects, The window object, the with statement, the

document object, the image object, the history object, the location object, the navigator object.

5) JavaScript Language Objects:

JavaScript Language Objects, the string Objects, Additional String Objects Methods, Evaluating Strings, The Array Object, the Date Object, Setting and Extracting Time Information, the math object, Developing interactive Forms, Overview of Form Controls, Referring to form objects, the form objects, the button object, the check box object, the text and textarea object, the radio button object, the select object, Form Validation.

6) Cookies and JavaScript Security:

How Are Cookies Sent?, Storing Cookies, Why Use Cookies?, Assigning a Cookie, Testing For Cookie Presence, Clearing a Cookie, Controlling Cookies in the Browser, Cookies and Password, JavaScript Security Issues.

7) Controlling Frames in JavaScript:

Understanding Frames and Targets, Targeting Frames in JavaScript, Changing Two or More Frames, Frames, Functions and Variables, Targeting Windows, Window, Function and Variable.

8) Client Side JavaScript:

Image Maps, Defining the Image Map, Adding Script to an Image Map, The navigator Object, and Custom JavaSCript Objects, Advantages of Custom Objects, Custom Object Demonstration, Creating a JavaScript Object: the Constructor, Creating an Instance of a Custom Object, Creating Object Methods, Creating Function of your Objects, Complex Custom Objects.

XML

9) ACTIVE SERVER PAGES:

ASP mechanics, What Are ASP Application?, Virtual Directories and ASP Application, ASP Delimiters, Starting a Web Application, Structure of an ASP application.

10) Using VBScript:

Differences between VBScript and JavaScript, Declaring Variables with VBScript, Program Flow.

11) ASP Intrinsic Objects:

Scripting Context, Built in and installable object: Server Object, application Object, Session Object, Request Object and Response object.

ASP Default Components:Using components, Global Components, ASP default Components.

12) ActiveX data objects:

Open Database Connectivity (ODBC) and OLE DB, ActiveX data objects, Registering Data Source Name (DSN).

Subject: Cyber law (MCA-335)

1) Cyber Law

- Provisions in Indian Laws in dealing with Cyber Crimes and its critical analysis
- Information Technology Act, 2000.
- Penalties Under IT Act
- Offences Under IT Act
- Offences Related With Digital Signature and Electronic Signature Under IT Act
- Statutory Provisions
- Establishment of Authorities under IT Act and their functions, powers, etc
- Controller
- Certifying Authorities
- Cyber Regulation Appellate Tribunal
- Adjudicating officer

2) Investigation of Cyber Crimes

- Agencies for investigation in India, their powers and their constitution as per Indian Laws
- Procedures followed by First Responders;
- Evidence Collection and Seizure Procedures of Digital mediums
- Securing the Scene, Documenting the Scene, Evidence Collection and Transportation
- Data Acquisition
- Data Analysis
- Reporting

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3) Intellectual Property Rights and Cyber Law

- Objects of copyright
- Requirement and Meaning of copyright
- Copyright as bundleof rights
- Framing
- Linking & infringement
- Information Technology act related to copyright and Acts which are not infringement ofMusic & copyright infringement
- Moral rights and internet prospective on intellectual property rights
- Domain name Disputes

4) Types of Crime

- Types of Cyber Crimes:
- Crimes targeting Computers:
- Unauthorized Access
- Packet Sniffing
- Malicious Codes including Trojans, Viruses, Logic Bombs, etc.
- Online based Cyber Crimes:
- Phishing and its variants
- Web Spoofing andE-mail Spoofing
- Cyber Stalking
- Web defacement
- Financial crimes, ATM and Card Crimes, etc.
- Spamming
- Commercial espionage and Commercial Extortion online
- Software and Hardware Piracy
- Money Laundering
- Fraud & Cheating
- Other Cyber Crimes

5) Cyber Forensics & Cyber Crime

- Introduction

- Conventional Crime VS Cyber Crime
- Reasons for Cyber Crime.
- Classification of Conventional and Cyber Crime
- Distinction between Conventional and Cyber Crime.
- Cyber Criminal Mode and Manner of CommittingCyber Crime.
- Computer crime prevention measures

6) Computer Security

- Computer Security:
- Information Security Overview
- Information Security Services
- Types of Attacks
- Goals for Security
- Network Security:
- Overview of Security threats
- HackingTechniques
- Password Cracking
- Insecure Network connections
- Malicious Code
- Email security: PGP and SMIME
- Web Security: web authentication, SSL and SET
- Database Security
- Operating System Security
- E-commerce Security

7) Concealment Techniques

- Spoofing
- Hijacked session attacks
- Polymorphism
- Stenography
- Reversing stenographic process
- Counter or anti forensics

- Cloaking Techniques (Data Hide and Seek),
- Renaming and Manipulating File System,
- Data Hiding on NTFS with Alternate data Stream

8) Cyber Law related to Ecommerce

- Introduction
- The technical & economic context
- Types of Ecommerce
- Legal issues in E-commerce
- Benefits and disadvantages of E-commerce
- E-banking
- Risk of Ecommerce

9) Cryptography

- Types of Cryptography
- What is Digital Signature?
- How Digital Signature works?
- Creation and Verification of Digital signature
- Certifying Authority
- Controller
- Refusal or renewal of license

Reference Books :

1) Cyber Law in India by Farooq Ahmad- Pioneer Books

2) Guide to Cyber and E- Commerce Laws by P. M. Bukshi and R. K. Suri- Bharat Law House, New Delhi

3) The Information technology Act, 2000- Bare Act- Professional Book Publishers, New Delhi.

4) Computer Forensics: Principles and Practices by Linda Volonino, Reynaldo Anzaldua and Jana Godwin -Pearson Prentice-Hall 2007.

5) First Responder's Guide to Computer Forensics by Richard Nolan et al.- Carnegi Mellon, 2005.

6) Digital Evidence and Computer Crime, 2nd ed. By Eoghan Casey- Acdemic Press,2004.

7) Scene of the Cybercrime: Computer Forensics Handbook by Syngress.

8) Security and Incident Response by Keith J. Jones, Richard Bejtlich and Curtis W. Rose

9) List of Websites for more information is available on :

Http://www.garykessler.net.library/forensicsurl.html

10) Introduction to Forensic Science in Crime Investigation By Dr.(Smt) Rukmani Krishnamurthy

11) Cyber Laws - Dr Gupta & Agrawal , Premier publishing Company

12) Cyber Law simplified – Vivek Sood ,Tata MaGraw-Hill

13) Nature of Cyber Laws - S.R. Sharma , Anmol Publications

14) Dimensions of Cyber Crime - S.R. Sharma, Anmol Publications

15) Computer Forensics & Cyber Crimes,MarjieBritz (pearson)