MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES
Course Structure for Master of Computer Applications
(Choice Based Credit System)
(with effect from the academic year 2016- 2017 onwards)
(44th SCAA meeting held on 30.05.2016)

Sem	Sub 'Pr. No.	Subject status	Subject Title	Hrs/ week	Cre-dits	Marks				
						Maximum			Passing minimum	
						Int.	Ext.	Tot.	Ext.	Tot.
III	15	Core - 11	Financial Management and Accounting	4	4	25	75	100	38	50
	16	Core - 12	Computer Graphics & Multimedia	4	3	25	75	100	38	50
	17	Core-13	Advanced Java Programming	4	4	25	75	100	38	50
	18	Core-14	Data Computer and Networks	4	4	25	75	100	38	50
	19	Core-15	Object Oriented Analysis Design using UML	4	4	25	75	100	38	50
	20	Practical-V	Graphics and Multimedia	5	4	50	50	100	25	50
	21	Practical – VI	Advanced Java Programming	5	4	50	50	100	25	50

IV	22	Core – 16	Open Source Technology	4	3	25	75	100	38	50
	23	Core-17	RDBMS	4	4	25	75	100	38	50
	24	Core-18	Mobile Computing	4	4	25	75	100	38	50
	25	Elective - I & II (Select any Two)	a. Principles of Complier Design b.Soft Computing c.Professional Practice d.Biometrics e.Security in Computing	8	8	25	75	100	38	50
	26	Practical-VII	Open Source Technology	5	4	50	50	100	25	50
	27	Practical - VIII	RDBMS	5	4	50	50	100	25	50
V	28	Core - 19	Research Methodology	4	3	25	75	100	38	50
	29	Core – 20	Net Programming	4	3	25	75	100	38	50
	30	Core - 21	Cloud Computing	4	4	25	75	100	38	50
	31	Elective – III & IV (Select any Two)	a. Big Data Analytics b. Embedded System c. Data Mining d. Digital Image Processing e. E-Commerce	8	8	25	75	100	38	50
	32	Practical-IX	Net Programming	5	4	50	50	100	25	50
	33	Mini Project	Mini Project Lab	5	4	50	50	100	25	50
VI	34	Major Project	Project	-	10	50	50	100	25	50

MSU / 2016-17 / PG –Colleges / M C A / Semester -III / Ppr.no.15 / Core -11

Financial Management and Accounting

UNIT - I

Financial Accounting – Need or accounting – Definition – Objectives and Advantages – Branches of Accounting – Types of Accounts – Accounting rules – Accounting Cycle – Journal – Ledger – Trial Balance – trading & Profit and loss account and Balance sheet.

UNIT- II

Financial Management - Nature, Scope and Objectives – Finance functions – Profit maximization Vs Wealth maximization - Role and Responsibilities or a financial manager in the changing scenario – Methods of Financial management – Importance of Financial Management.

UNIT- III

Financial Statement Analysis and interpretation – Meaning and types of financial statement – Types of financial analysis – Steps in Financial statement analysis – Methodical Classification – Techniques of financial analysis – Limitations of financial analysis – Practical problems.

UNIT - IV

Ratio analysis – meaning – Classification – Liquidity, Solvency, Profitability and turnover ratios – Advantages and limitations – Practical problems. Funds Flow analysis – Meaning uses – Preparation of funds flow statement. Cash flow analysis – Meaning – Preparation- Difference between fund flow and cash flow analysis – Utility and limitations of cash flow analysis – Practical problems.

UNIT- V

Mechanized Accounting – Electronic Data Processing - Computer Applications in Accounting – MIS – Computer – Information technology & MIS.

Reference Books:

1. S.P.Jain and K.L.Narang – Advanced Accounting, Kalyani Publishers, New Delhi.
2. S.P.Iyengar – Advanced Accounting, Sultan Chand and Sons, New Delhi.
3. R.L.Gupta and M.Radhaswamy – Advanced Accounting, Sultan Chand and Sons, New Delhi.
4. S.N.Maheswari and C.B.Gupta, Financial Management, Sultan Chand and Sons, New Delhi.
5. S.N.Maheswari, Management Accounting, Sultan Chand and Sons, New Delhi.

MSU / 2016-17 / PG –Colleges / M C A / Semester -III / Ppr.no.16 / Core -12

Computer Graphics and Multimedia

UNIT- I BASIC CONCEPTS

2D Transformations – Clipping – Window – View Prot Mapping – Graphical User Interfaces andInteractive Input Methods – Picture Construction Techniques – Virtual Reality Environment.

UNIT- II 3D GRAPHICS

3D Transformation – 3D Viewing – Visible Surface Detection – Back Face Detection – Depth Buffer Method – Scan Line Method.

UNIT- III MULTIMEDIA BASICS

Introduction to Multimedia – Components – Hypermedia – Authoring – Authoring tools – File formats –Color models – Digital Audio representation – Transmission – Audio signal processing – Digital music making – MIDI – Digital video – Video compression techniques – Video performance measurements – Multimedia Databases – Animation – Key frames and tweening techniques – Principles of animation – Virtual reality – Multimedia for portable devices

UNIT- IV MULTIMEDIACOMMUNICATION

Stream characteristics for Continuous media – Temporal Relationship – Object Stream Interactions - Media Synchronization – Models for Temporal Specifications – Streaming of Audio and Video – Recovering from packet loss – RTSP — Multimedia Communication Standards –RTP/RTCP – SIP and H.263- Real time streaming and On-demand streaming

UNIT-V MULTIMEDIA APPLICATION DEVELOPMENT

Design, Development and evaluation of multimedia a system - The development of user interface design - Design Process - MultiMedia & the Internet - Multimedia conferencing - Multimedia file sharing – Multimedia broadcasting - Multimedia Development Issues - Multimedia project – Structured Multimedia development - Multimedia project timing - Sample project

Reference Books:

1. Donald Hearn and M. Pauline Baker, “Computer Graphics in C Version”, Second Edition, Pearson Education
2. Tom McReynolds – David Blythe “ Advanced Graphics Programming Using OpenGL” , Elsevier, 2010
3. Parag Havaldar and Gerard Medioni, “Multimedia Systems-Algorithms, Standards and IndustryPractices”,Course Technology, Cengage Learning, 2010.
4. John F. Koegel Bufend , “Multimedia systems”, Pearson Education, Delhi, 2002
5. Ralf Steinmetz and Klara “Multimedia Computing, Communications and Applications”, PearsonEducation,2004.
6. Kurose and Ross, ‘Computer Networks : A top down Approach’, Pearson Education, 2002
7. Mohammad Dastbaz, Desgning Interactive Multimedia Systems
8. Multimedia – Technology and applications David Hillman Galgotia Publications, Delhi
9. Ralf Steinmetz and Klara Nahrstedt “Multimedia Applications”, Springer, 2007.

MSU / 2016-17 / PG –Colleges / M C A / Semester -III / Ppr.no.17 / Core -13

Advanced Java Programming

UNIT-I

OOP and Java: Introduction – Objects and Classes – Java Language – Creating a Simple Java Application Program.Arrays and Methods:Introduction-One and Two dimensional Arrays-Methods-Methods Overloading

Classes and Objects: Introduction **–** General Form – Object Creation – Constructor-finalize()- static member-Inner and Anonymous Inner classes

Inheritance: Introduction-Inheritance Types-General Form of sub class- sub class constructor-abstract and final classes

UNIT -II

Interface and Packages: Introduction-General Form-Implementation of an Interface – Packages-Placing classes in the packages-import statement-setting class path – Access control modifiers

Exception Handling: Introduction-Default Exception handling-Exception and Error classes-try-catch-throw-throws-finally-custom exception

Multithreading: Introduction-Life cycle of Thread- Creating, stopping and blocking threads -thread priorities - Thread synchronization- Dead Lock-Inter-thread communication.

Applet programming: Introduction-Life cycle of an Applet-Applet class-Creating a Simple Applet-Syntax of Applet tag-Graphics class

UNIT-III

Abstract Windows Toolkit (AWT)-I: Introduction-Events- Listeners-Event Handling Methods- Interfaces, Controls such as Label,Button, Checkbox, Radiobutton, Choice,List, Scrollbar-Layout Manager

Abstract Windows Toolkit (AWT)-II: Introduction-Windows and Frames-Menus- Dialogs-MouseEvent and their listeners-Adapter classes-Inner classes-Anonymous Inner classes

Swing: Introduction - JApplet-I cons - Jalbel- Jbutton -J TextField – Jcheckbox - JradioButton -J Menu

Networking: Introduction-TCP and UDP Approach

UNIT-IV

RMI: Introduction-Remote Interface-java.rmi.Server package-Naming Class-RMIException-Creating a simple RMI Client and Server application

JDBC: Java database connectivity, Types of JDBC drivers, Writing JDBC applications, Types of statement objects(Statement, PreparedStatement and CallableStatement), Types of resultset, Inserting and updating records,Using Transactions

Java Beans: An Overview of JavaBeans - Background-Software Components – Properties, Events and Methods - Introspection and Builder Tools – BDK - The Benefits of Java Components

Building Simple Beans: Your First Bean-Introspectiona and Naming convention-Difference between a Bean and other class

UNIT-V

Java Servlets: Java Servlets and CGI Programming-A Simple Java Servlet - Anatomy of a Java Servlet - Reading Data from a Client-Sending Data to a Client-Working with Cookies-Tracking Sessions. Java Server pages:JSP-JSP tags-Tomcat-Request String-User Sessions-Cookies-Session Objects

Reference Books:

1. Herbert Schildt, “The Complete Reference”, Seventh Edition, [TMH]
2. Joseph O’Neil, “JavaBeans Programming”, TMH
3. Jim Keogh,”The Complete Reference J2EE”,TMH
4. C.Muthu,” Programming with Java”, Second Edition, VNI.

MSU/ 2016-17 / PG –Colleges / MCA / Semester -III / Ppr.no.18 / Core -14

Data Communication and Networks

UNIT- I NETWORK FUNDAMENTALS

Uses of Networks – Categories of Networks-Communication model –Data transmission conceptsand terminology – Protocol architecture – Protocols – OSI – TCP/IP – LAN Topology – Transmission media

UNIT - II DATA LINK LAYER

Data link control - Flow Control – Error Detection and Error Correction - MAC – Ethernet, Token ring, Wireless LAN MAC – Blue Tooth - Bridges.

UNIT- III NETWORK LAYER

Network layer – Switching concepts – Circuit switching – Packet switching –IP — Datagrams – IP addresses- IPV6– ICMP – Routing Protocols – Distance Vector – Link State- BGP.

UNIT - IV TRANSPORT LAYER

Transport layer –service –Connection establishment – Flow control – Transmission control protocol – Congestion control and avoidance – User datagram protocol. -Transport for Real Time Applications (RTP).

UNIT- V APPLICATIONS LAYER

Applications - DNS- SMTP – WWW –SNMP- Security –threats and services - DES- RSA-websecurity -SSL

Reference Books:

1. Larry L. Peterson & Bruce S. Davie, "Computer Networks – A systems Approach", Fourth Edition,Harcourt Asia / Morgan Kaufmann, 2007.
2. William Stallings, "Data and Computer Communications", Nineth Edition, Prentice Hall , 2011.
3. Forouzan, "Data Communication and Networking", Fifth Edition , TMH 2012
4. Andrew S.Tannenbaum David J. Wetherall, "Computer Networks" Fifth Edition , PearsonEducation 2011
5. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-down Approach, PearsonEducation, Limited, sixth edition,2012.
6. John Cowley, "Communications and Networking : An Introduction", Springer Indian Reprint, 2010.
7. Achyut S Godbole,Atul Hahate, " Data Communications and Networks"second edition 2011
8. Wayne Tomasi, " Introduction to Data communications and Networking" , Pearson 2011

MSU / 2016-17 / PG –Colleges / MCA / Semester -III / Ppr.no.19 / Core -15

Object Oriented Analysis and Design Using UML

UNIT - I INTRODUCTION

An overview – Object basics – Object state and properties – Behavior – Methods – Messages –Information hiding – Class hierarchy – Relationships – Associations – Aggregations- Identity –Dynamic binding – Persistence – Metaclasses – Object oriented system development life cycle.

UNIT - II METHODOLOGY AND UML

Introduction – Survey – Rumbugh, Booch, Jacobson methods – Patterns – Creational – AbstractFactory – Factory Method – Behavioral – Momento – Mediator - Structural – Decorator - Facade -Concurrency Patterns –Lock – Reactor – Scheduler - Frameworks – Unified approach – Unifiedmodeling language – Static and Dynamic models – UML diagrams – Class diagram – Usecasediagrams – Dynamic modeling – Model organization – Extensibility.

UNIT - III OBJECT ORIENTED ANALYSIS

Identifying Usecase – Business object analysis – Usecase driven object oriented analysis – Usecasemodel – Documentation – Classification – Identifying object, relationships, attributes, methods –Super-sub class – A part of relationships Identifying attributes and methods – Object responsibility.

UNIT - IV OBJECT ORIENTED DESIGN

Design process and benchmarking – Axioms – Corollaries – Designing classes – Class visibility –Refining attributes – Methods and protocols – Object storage and object interoperability – Databases– Object relational systems – Designing interface objects – Macro and Micro level processes – Thepurpose of a view layer interface-OOUI - MVC Architectural Pattern and Design – Designing thesystem.

UNIT -V QUALITY AND TESTING

Quality assurance – Testing strategies – Test cases – Automated Testing Tools – Case Study -Cryptanalysis – Health Care Systems- Inventory Control System - Rational Rose Suite.

Reference Books:

1. Ali Bahrami, “Object Oriented System Development”, McGraw Hill International Edition, 2008.
2. Craig Larman, Applying UML and Patterns, 2nd Edition, Pearson, 2002.
3. Brahma Dathan, Sarnath Ramnath, “Object-Oriented Analysis, Design and Implementation”,Universities Press, 2010.
4. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling Language User Guide”,Addison Wesley Long man, 1999.
5. Bernd Bruegge, Allen H. Dutoit, Object Oriented Software Engineering using UML, Patterns andJava, Pearson 2004
6. Martin Fowler, “UML Distilled A Brief Guide to Standard Object Modeling Language”, 3rd Edition,AddisonWesley, 2003
7. Russ Miles, Kim Hamilton, “Learning UML 2.0”, O’Reilly, 2008.

MSU / 2016-17 / PG –Colleges / MCA / Semester -III / Ppr.no.20 / Practical -V

Graphics and Multimedia Lab

GRAPHICS LAB

1. House
2. Moving a Car
3 .Bouncing a ball
4 .Random Ball
5 .Polygon
6. DDA Line Drawing Algorithm
7. Bresenham's Line Drawing Algorithm
8. Circle Generating Algorithm
9. Circle within a circle
10. Ellipse Generating Algorithm
11. 2D Transformation
12. 2D Scaling
13. 2D Rotation

MULTIMEDIA LAB

I.FLASH

1.Frame by frame animation
2.Bouncing ball with button

II.PHOTOSHOP

3.Brouchure for an Institution
4.Cropping the Image
5. Colour Models

III. DREAM WEAVER

6.Table
7.Linking Files

MSU / 2016-17 / PG –Colleges / MCA / Semester -III / Ppr.no.21 / Practical - VI

Advanced Java Programming Lab

1. Write a java application program to demonstrate class with constructors.
2. Write a java application program to demonstrate inheritance
3. Write a java application program to demonstrate interface and package.
4. Write a java application program to create custom exception.
5. Write a java application program to demonstrate thread synchronization.
6. Write a java applet program to demonstrate life cycle of an applet.
7. Write a java applet program using AWT – I components (Using Event Handling)
8. Write a java applet program using AWT – II components (Using Event Handling).
9. Write a java applet program using swing components (Using Event Handling)
10. Write a program in java to implement a Client/Server application using TCP and UDP approach.
11. Write a program in Java to implement a client/Server application using RMI.
12. Write a program in Java to implement JDBC connection process.
13. Write a program in Java to create a form and validate a password using Servlet.
14. Write a program in Java to create a form and validate a password using JSP.
15. Develop a simple Java Bean.

MSU / 2016-17 / PG –Colleges / MCA / Semester -IV / Ppr.no.22 / Core -16

Open Source Technology

UNIT - I

PHP Crash Course: Before you begin – Creating a Sample Application – Embedded PHP in HTML – Adding Dynamic Content – Accessing form variables – Understanding identifiers. Examining Variable types – Declaring and using Constants – Understanding Variable Scope.Using operators – Working out the form totals – Understanding precedence and Associativity – Using variable functions. Making Decisions with Conditionals - Repeating actions through iteration. – Breaking out of a Control Structure or Script – Employing Alternative Control

UNIT - II

Using Arrays: Array – Numerically indexed arrays – Arrays with different indices – Array operators – Multidimensional Arrays.String Manipulation and Regular Expressions:

Create a sample application: Smart Form Mail – Formatting Strings – Functions using substr(). – Comparing Strings.Managing the Date and Time: Getting the date and Time from PHP – Converting between PHP and MySQL Date formats –Calculating Dates in PHP – Calculating Dates in MySQL – Using Microseconds – Using the Calendar Functions.

UNIT- III

Reusing Code and Writing Functions: The Advantages of Reusing code –Using require () and include() Filename extensions and require() – Using require() for website templates. Using Functions in PHP: Calling Functions – Calling an undefined Function – Understanding case and function names – Defining your own functions – Examining Basic Function Structure – Using Parameters – Understanding Scope – Passing by reference versus Passing by value – Using the return Keyword – Implementing Recursion.

UNIT- IV

Creating Your Web Database: Creating Databases and Users – Setting Up Users and Privileges – Introducing MySQL's Privilege System – Setting up a user for the web – Using the Right Database – Creating Database Tables.Working with Your MySQL Database: SQL – Inserting Data into the Database – Retrieving Data from Database: Retrieving Data with Specific Criteria – Retrieving Data in a Particular order. – Updating Records in the database – Altering Tables after Creation – Deleting Records from the Database – Dropping Tables – Dropping the whole Database.

UNIT- V

Accessing Your MySQL Database from the web with PHP: How web Database Architectures work – Querying a Database from the web.Using Session Control in PHP: Session Control – Understanding Basic session Functionality – Implementing simple sessions – Creating a session Example – Configuring Session Control – Implementing Authentication with session.Interacting with the File System and the Server: Uploading files: HTML for File Upload – Writing the PHP to deal with the file – Avoiding Common Upload Problems.

Text Book:

PHP and MySQL Web Development – Fourth Edition (2010) by Luke Welling, Laura Thomson, Pearson Education

Reference Books:

1. A Beginner's Guide PHP by Vikram Vaswani, Tata Mcgraw Hill Education Private
2. PHP 6 and MySQL 5 by Larry Ullman, Pearson Education, 2008.

MSU / 2016-17 / PG –Colleges / MCA / Semester –IV / Ppr.no.23 / Core -17

RDBMS

UNIT I

Introduction – Purpose of data base systems – Data Models – Data Languages – transaction management – storage Management – DBA – Database Users – System Structures – E-R Models—Entiy and Entity Relationships – Mapping constraints and E-R Diagrams.

UNIT II

Structure of Relational databases – Relational Algebra – Tuple Relational calculus – Domain Relational Calculus – Relational commercial languages (SQL,QBE,QUEL)-Integrity constraints – Normalization – Boyce – Codd – Third and Fourth normal forms – domain – key normal form.

UNIT III

Basic SQL Operations – creating a table – Insert – Rollback – Commit – Autocommit-Delete-Update-Select, From, where and Order by-Single value tests-Like-Simple tests against a list of values-Combining logic-Combining tables-Dropping a column-creating a table from a table-Date functions-Conversion functions-Translate-Decode-Creating a view-Advanced sub queries – Outer joins- Natural & inner joins – Union, Intersect & Minus – synonyms – indexes – Table spaces – Clusters – Sequences.

UNIT IV

Basics of Object – Relational databases: Objects – Abstract Data types – Nested tables – Varying arrays – Large objects – References – Object Views – Naming conventions for objects – Structures of an Object.

User, Roles and Privilege: Create a user – password management – Three standard roles – Format for Grant command – Revoking privileges – what user can Grant: Moving to another user – create synonym – Create a role – Granting privileges to a role – Granting role to another role – Adding password to a role - Removing a password from a role – Enabling & Disabling roles– Revoking privilreges from a role – dropping roles.

UNIT V

An introduction to PL/SQL: PL/SQL overview – Declarations section – Executable command section – Exception handling section – Triggers: Syntax – Types of Triggers: Row level – statement – level – before & after – instead of – Schema – database – Level triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, functions & Packages: syntax – Compile – Replace – Drop procedure, Functions & Packges – Cursor Management.

Reference Books:

1.Data System Concepts – Abraham Silberchatz, Henry K.Horth, McGraw Hill,2001.
2.ORACLE 9i – The Complete Reference – Kevin Loney, George Koch & The experts at Tusc, Tata Mc Graw Hill Publishing Company Ltd.,2002.

Mobile Computing

UNIT – I

Introduction : Mobility of bits and bytes – Wireless the beginning – Mobile Computing – Dialogue control – Networks – Middleware and gateways – Applications and services – Developing mobile computing applications.

Mobile Computing Architecture : Architecture of Mobile Computing – Three Tire Architecture – Design Consideration for mobile computing - Making existing applications to mobile enabled.

Mobile Computing Through Telephony : Multiple Access procedure – Satellite Communication System - Mobile Computing Through Telephone – Developing an IVR Application – Voice XML –Telephony Application Program Interface.

UNIT – II

Emerging Technologies : Introduction – Bluetooth – Radio Frequency Identification(RFID) – Wireless Broadband(WIMAX) – Mobile IP – Internet Protocol version 6(IPV6).

Global System for Mobile Communication : Introduction – GSM Architecture – GSM Entities – Call Routing in GSM – PLMN interface – GSM addresses and identifiers – Network Aspects in GSM – Mobility Management – GSM frequency allocation – Personal Communication service – Authentication and Security.

Short Message Service : Mobile Computing over SMS - Short Message Service(SMS) – Value added Services through SMS – Accessing the SMS bearer.

UNIT – III

General Packet Radio Service (GPRS) : Introduction – GPRS and Packet data Networking – GPRS Network Architecture - GPRS Network Operations – Data Services in GPRS – Applications for GPRS – Limitations of GPRS – Billing and Charging in GPRS – Enhanced Data rate for GSM Evaluation (EDGE).

Wireless Application Protocol: Introduction – WAP – MMS – GPRS Applications.

CDMA and 3G: Introduction – Spread Spectrum Technology – IS-95 – Wireless Data – Third Generation Networks – Applications of 3G.

UNIT – IV

Wireless LAN: Wireless LAN Advantages – IEEE 802.11 Standards – Wireless LAN Architecture – Mobility in Wireless LAN – Deploying Wireless LAN – Mobile Adhoc Networks and Sensor Networks – Wireless LAN security – Wireless Access in Vehicular Environment – Wireless Local Loop – Hiper LAN – WIFI versus 3G.

Intelligent Networks and Interworking: Fundamentals of Call Processing – Intelligence in the Networks – SS#7 Signalling – IN Conceptual Model (INCM) – Softswitch – Programmable Networks – Technologies and Interfaces for IN.

Client Programming : Mobile Phones – Features of Mobile phones – PDA – Design constraints in Applications for Handheld devices – Recent Developments in Client Technology.

UNIT – V

Programming for the PALM OS: History of PALM OS – PALM OS architecture – Application Development – Communication in PALM OS – Multimedia.

Wireless Devices with Symbian OS: Introduction to Symbian OS - Symbian OS Architecture – Security on Symbian OS.

Security Issues in Mobile Computing: Information Security – Security Techniques and Algorithms – Security Protocols – Public Key Infrastructure.

Text Book:

1. Asoke K Talukder , Hasan Ahmed and Roopa R Yavagal, “Mobile Computing : Technology, Applications and Service Creation”, Second Edition , TMH, 2010

Principles of Compiler Design

UNIT- I INTRODUCTION

Introduction to Compiler: Language Processors – The Structure of a Compiler – The Evolution of Programming Languages – The Science of Building a Compiler – Application of Compiler Technology – Programming Language Basics. A simple Syntax – Directed Translator: Syntax Definition – Syntax – Directed Translation – Parsing – A Translator of Simple Expression – Lexical Analysis – Symbol Table – Intermediate Code Generation.

UNIT- II LEXICAL ANALYZER

Lexical Analysis: The Role of the Lexical Analyzer – Input Buffering – Specification of Tokens – Recognition of Tokens – The Lexical – Analyzer Generator Lex – Finite Automata – From Regular Expression to Automata – Design of a Lexical – Analyzer Generator – Optimization of DFA – Based Pattern Matchers.

UNIT- III SYNTAX ANALYZER

Syntax Analysis: Introduction – Context – Free Grammars – Writing a Grammar – Top-Down Parsing – Bottom-Up Parsing – Introduction to LR Parsing: Simple LR – More Powerful LR Parsers – Using Ambiguous Grammars.

UNIT- IV INTERMEDIATE – CODE GENERATION AND RUN- TIME ENVIRONMENT

Intermediate – Code Generation: Variants of Syntax Trees – Three – Address Code – Types and Declarations – Translations of Expressions – Type Checking – Control Flow – Back patching – Switch Statements – Intermediate Code for Procedures – Run-Time Environments: Storage Organization – Stack Allocation of Space – Access to Nonlocal Data on the Stack:

UNIT- V CODE GENERATION

Code Generation: Issues in the Design of a Code Generator – The Target Language – Address in the Target Code – Basic Blocks and Flow Graph – Optimization of Basic Blocks – A Simple Code Generator – Peephole Optimization – Register Allocation and Assignments – Instruction Selection by Tree Rewriting - Optimal Code Generation for Expression – Dynamic Programming Code-Generation. Machine-Independent optimization: ThePrincipal Source of Optimization.

Text Books:

1.Alfred V.Aho, Monica S. Lam, Ravi Sethi, Jeffrey D.Ullman, "Compilers –Principles, Techniques and Tools", Pearson Education Asia,2011.
2.Compiler Design, K. Muneeswaran, Oxford University Press.

Reference Books:

1.Alfred V. Aho,Ravi Sethi, Jeffrey D.Ullman, " Compilers – "Principles, Techniques and Tools", Pearson Education Asia,2007.
2. A. V. Aho,Ravi Sethi, J.D.Ullman, " Compilers – "Principles, Techniques and Tools", Addission – Wesley ,2003.
3.Allen I. Holub," Compiler Design in C", Prentice Hall of India,2001.
4.Fischer Leblanc, Crafting Compiler, Benjamin Cummings, Menlo Park, 1988.

Soft Computing

UNIT- I INTRODUCTION TO SOFT COMPUTING

Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT- II GENETIC ALGORITHMS

Introduction, Building block hypothesis, working principle, Basic operators and Terminologies like individual, gene, encoding, fitness function and reproduction, Genetic modeling: Significance of Genetic operators, Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, GA optimization problems, JSPP (Job Shop Scheduling Problem), TSP (Travelling Salesman Problem),Differences & similarities between GA & other traditional methods, Applications of GA.

UNIT- III NEURAL NETWORKS

Machine Learning using Neural Network, Adaptive Networks – Feed Forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance Architectures – Advances in Neural Networks.

UNIT- IV FUZZY LOGIC

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions-Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making.

UNIT- V NEURO-FUZZY MODELING

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification andRegression Trees – Data Clustering Algorithms – Rule base Structure Identification – Neuro-FuzzyControl – Case Studies.

Reference Books:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, “Neuro-Fuzzy and Soft Computing”,Prentice-Hall of India, 2003
2. Kwang H.Lee, “First course on Fuzzy Theory and Applications”, Springer–Verlag BerlinHeidelberg, 2005.
3. George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic-Theory and Applications”, Prentice Hall,1995.
4. James A. Freeman and David M. Skapura, “Neural Networks Algorithms, Applications, andProgramming Techniques”, Pearson Edn., 2003.
5. David E. Goldberg, “Genetic Algorithms in Search, Optimization and Machine Learning”, AddisonWesley, 2007.
6. Mitsuo Gen and Runwei Cheng,”Genetic Algorithms and Engineering Optimization”, WileyPublishers 2000.
7. Mitchell Melanie, “An Introduction to Genetic Algorithm”, Prentice Hall, 1998.
8. S.N.Sivanandam, S.N.Deepa, “Introduction to Genetic Algorithms”, Springer, 2007.
9. A.E. Eiben and J.E. Smith “Introduction to Evolutionary Computing” Springer, 2003
10. E. Sanchez, T. Shibata, and L. A. Zadeh, Eds., "Genetic Algorithms and Fuzzy Logic Systems:Soft Computing Perspectives, Advances in Fuzzy Systems - Applications and Theory", Vol. 7,River Edge, World Scientific, 1997.
11. ROSS TIMOTHY J, Fuzzy Logic with Engineering Applications, Wiley India Pvt Ltd, New Delhi, 2010

Professional Practice

UNIT- I COMPUTER ETHICS INTRODCUTION AND COMPUTER HACKING

A general Introduction – Computer ethics: an overview – Identifying an ethical issue – Ethics and law – Ethical theories - Professional Code of conduct – An ethical dilemma – A framework for ethicaldecision making - Computer hacking – Introduction – definition of hacking – Destructive programs –hacker ethics - Professional constraints – BCS code of conduct – To hack or not to hack? – Ethicalpositions on hacking

UNIT- II ASPECTS OF COMPUTER CRIME AND INTELLECTUAL PROPERTY RIGHTS

Aspects of computer crime - Introduction - What is computer crime – computer security measures – Professional duties and obligations - Intellectual Property Rights – The nature of Intellectual property– Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright - The extent and nature of software piracy – Ethical and professional issues – free software and open source code

UNIT- III REGULATING INTERNET CONTENT, TECHNOLOGY AND SAFETY

Introduction – In defence of freedom expression – censorship – laws upholding free speech – Freespeech and the Internet - Ethical and professional issues - Internet technologies and privacy –Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk

UNIT- IV COMPUTER TECHNOLOGIES ACCESSIBILITY ISSUES

Introduction – Principle of equal access – Obstacles to access for individuals – professional responsibility - Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting –social, legal and professional issues - Use of Software, Computers and Internet-based Tools -Liability for Software errors - Documentation Authentication and Control – Software engineering codeof ethics and practices – IEEE-CS – ACM Joint task force

UNIT -V SOFTWARE DEVELOPMENT AND SOCIAL NETWORKING

Software Development – strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking – Online virtual world – Crime in virtual world - digital rights management - Online defamation – Piracy –Fraud

Reference Books:

1. Penny Duquenoy, Simon Jones and Barry G Blundell, “Ethical , legal and professional issues in computing”, Middlesex University Press, 2008
2. George Reynolds, “Ethics in Information Technology”, Cengage Learning, 2011
3. Caroline Whitback,” Ethics in Engineering Practice and Research “, Cambridge University Press,2011
4. Richard Spinello, “Case Studies in Information and Computer Ethics”, Prentice Hall, 1997.
5. John Weckert and Douglas Adeney, Computer and Information Ethics, Greenwood Press, 1997.
6. Sara Baase, “A Gift of Fire: Social, Legal, and Ethical Issues for Computing and the Internet”,3rd Edition,Prentice Hall, 2008
7. http://www.infosectoday.com/Articles/Intro_Computer_Ethics.htm

MSU / 2016-17 / PG –Colleges / MCA / Semester -IV/ Ppr.no.25 /Elective- I & II (d)

Bio-Metrics

UNIT- I

Biometrics: Benefits of Biometrics versus Traditional-Authentication methods- Benefits of Biometrics in Identification Systems.

Key Biometric Terms and Processes: Definitions-Discussions-Logical versus Physical Access-How Biometric Matching Works.

Accuracy in Biometric Systems: False Match Rate-False Non Match Rate – Failure –to-Enroll(FTE) Rate-Derived Metrics.

UNIT- II

Finger-Scan: Components - How Finger-Scan Technology Works – Competing Finger-Scan Technologies - Finger-Scan Deployments - Finger-Scan Strengths - Finger-Scan Weaknesses. **Facial-Scan:** Components - How Facial-Scan Technology Works - Competing Facial-Scan Technologies - Facial-Scan Deployments - Facial-Scan Strengths - Facial-Scan Weaknesses.

UNIT- III

Iris-Scan: Components - Its Working – Deployments -Iris-Scan Strengths - Iris-Scan

Voice-Scan: Components - Its Working – Deployments - Voice-Scan Strengths -

UNIT- IV

Other Physiological Biometrics:Hand-Scan: Components - Its Working - Deployments-Hand-Scan Strengths - Hand-Scan Weaknesses.

Retina- Scan: Components - Its Working – Deployments - Retina-Scan Strengths - Retina-Scan Weaknesses.

Automated Fingerprint Identification Systems (AFIS): Components - Its Working - Deployments – AFIS and Finger-Scan Differ.

UNIT- V

Other Leading Behavioral Biometrics: Signature-Scan: Components - Its Working – Deployments - Signature-Scan Strengths - Signature-Scan Weaknesses.

Keystroke-Scan: Components - Its Working – Keystroke-Scan Strengths -

Text Books:

Samir Nanavati, Michael Thieme, Raj Nanavati "Biometrics Identity Verification in a Networked world", A Wiley Tech Brief, New Delhi, Reprint:2011

Reference Books:

Biometrics: The Ultimate Reference – John D. Woodward,Jr.Nicholas M. Orlans Peter T.Higgins Published by Dreamtech Press, 2003, New Delhi-110002.

MSU / 2016-17 / PG –Colleges / MCA / Semester -IV/ Ppr.no.25 / Elective- I & II (e)

Security in Computing

UNIT- I ELEMENTARY CRYPTOGRAPHY

Terminology and Background – Substitution Ciphers – Transpositions – Making Good EncryptionAlgorithms- Data Encryption Standard- AES Encryption Algorithm – Public Key Encryption –Cryptographic Hash Functions – Key Exchange – Digital Signatures – Certificates

UNIT -II PROGRAM SECURITY

Secure programs – Non-malicious Program Errors – Viruses – Targeted Malicious code – ControlsAgainst Program Threat – Control of Access to General Objects – User Authentication – Good Coding Practices – Open Web Application Security Project Flaws – Common Weakness Enumeration Most Dangerous Software Errors

UNIT- III SECURITY IN NETWORKS

Threats in networks – Encryption – Virtual Private Networks – PKI – SSH – SSL – IPSec – ContentIntegrity – Access Controls – Wireless Security – Honeypots – Traffic Flow Security – Firewalls –Intrusion Detection Systems – Secure e-mail.

UNIT- IV SECURITY IN DATABASES

Security requirements of database systems – Reliability and Integrity in databases – Redundancy –Recovery – Concurrency/ Consistency – Monitors – Sensitive Data – Types of disclosures –Inference-finding and confirming sql injection

UNIT- V SECURITY MODELS AND STANDARDS

Secure SDLC – Secure Application Testing – Security architecture models – Trusted Computing Base – Bell-LaPadula Confidentiality Model – Biba Integrity Model – Graham-Denning Access Control Model – Harrison-Ruzzo-Ulman Model – Secure Frameworks – COSO – CobiT – Compliances – PCI DSS – Security Standards - ISO 27000 family of standards – NIST.

Reference Books:

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Fourth Edition, Pearson Education, 2007.
2. Michael Whitman, Herbert J. Mattord, “Management of Information Security”, Third Edition,Course Technology, 2010.
3.William Stallings, “Cryptography and Network Security : Principles and Practices”, Fifth Edition, Prentice Hall, 2010.
4. Michael Howard, David LeBlanc, John Viega, “24 Deadly Sins of Software Security:Programming Flaws and How to Fix Them”, First Edition, Mc GrawHill Osborne Media, 2009.
5. Matt Bishop, “Computer Security: Art and Science”, First Edition, Addison- Wesley, 2002.
6. https://www.owasp.org/index.php/Top_10_2010
7. https://www.pcisecuritystandards.org/security_standards/pci_dss.shtml
8. http://cwe.mitre.org/top25/index.html
9.Justin Clarke “SQL injection Attacks and defense” Elsevier ,2012

MSU / 2016-17/ PG –Colleges / MCA / Semester -IV/ Ppr. No.26 / Practical - VII

Open Source Technology Lab

1. Write a PHP Program to Perform Student Mark sheet using Operators and Decision making Statements.
2. Write a PHP Program to Generate Multiplication Table using Iterations.
3. Write a PHP Program to Implement Arrays.
4. Write a PHP Program to Implement Functions.
5. Write a PHP Program to Perform String Operations.
6. Perform the Following Operations in MySQL.
   (i) Create Database
   (ii) Drop Database
   (iii) Select Database
7. Perform the Following Operations in MySQL.
   (i) Create Tables
   (ii) Drop Tables
   (iii) Insert Query.
8. Perform the Following Operations in MySQL.
   (i) Select Query
   (ii) 'Where' Clause
   (iii) Update Query
9. Perform the Following Operations in MySQL.
   (i) Delete Query
   (ii) 'Like' Clause
   (iii) Sorting Results
10. Write a PHP Program to Connect MySQL Database to Display the Details of Particular Student.
11. Develop a Student Information System in PHP to allow View, Delete, Insert, Update the details of students.
12. Create a Login Module to Implement Sessions in PHP.
13. Write a PHP Program to Upload and Download Images from MySQL Database.
14. Create your own dynamic website using PHP and MySQL.

MSU / 2016-17 / PG –Colleges / MCA / Semester -IV/ Ppr. No.27 / Practical - VIII

RDBMS Lab

1. Creating Table and Queries
2. Creating a Table and view
3. Creating partitioned table
4. Table creation with abstract data type
5. Creating book table and SQL report
6. PL/SQL Program to print student mark card
7. PL/SQL Program to find Discount and Net amount
8. PL/SQL to print Multiplication table
9. PL/SQL to handle exception
10. PL/SQL Program to copy and erase the value in LOB column
11. PL/SQL Program to display selected column
12. Create Table, sequence and index
13. Procedure to find member details
14. Function creation for palindrome checking
15. Trigger based row updation
16. Electricity Bill calculation
17. Trigger based table manipulation Restriction
18. PL/SQL Block to handle package

MSU / 2016-17/ PG –Colleges / MCA / Semester -V/ Ppr.no.28 / Core -19

Research Methodology

UNIT – I

Research Methodology : Introduction - Meaning of Research – Objectives of Research – Types of Research – Motivation of Research – Research approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific method – Research process – Criteria of good Research – Problems encountered by Researchers in India. Defining the Research problem : What is a Research problem - Selecting the Problem – Technique involved Defining a problem. Research design : Meaning – Need for Research Design – Features of Good Design – Important concept relating to Research design – Different Research designs – Basic Principles of Experimental Designs.

UNIT – II

Sampling Design : Census and sample survey – Implications of a sample design – Steps in sample design - Criteria of selecting a sampling procedure – Characteristics of a good sample design – Different types of sample design – How to select a random sample – Random sample from an infinite Universe – Complex random sampling designs. **Measurements and scaling techniques :** Measurement in Research – Measurement scales – Sources of error in Measurement – Test and sound Measurements – Technique of developing measurement tools – Scaling, Meaning of scaling – Scale classification bases – Important scaling techniques – Scale Construction techniques.

UNIT – III

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design

UNIT – IV

Data Collection : Methods of Data collection – Collection of Primary Data – Observation Method – Interview method – Collection of data through Questionnaires – Collection of data through Schedules – Some other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection.

Interpretation and Report Writing : Meaning of interpretation – Why interpretation – Technique of interpretation – Precaution in Interpretation – Significance of Report Writing – Different Steps in Writing Report – Layout of the Research Report – Types of Reports – Mechanics of Writing a Research Report – Precautions for Writing Research Reports.

UNIT – V

Algorithmic Research : Introduction – Algorithmic Research Problems – Types of Solution Procedure/ Algorithm – Steps of Development of Algorithm – Steps of Algorithmic research – Design of Experiments and Comparison of Algorithms – Meta Heuristics for Combinational Problems. The computer – Its role in Research – The Computer and Computer Technology – The Computer System – Important Characteristics - Computer Applications – Computer and Researchers.

Text Books:

1. C.R.Kothari, "Research Methodology Methods and Techniques", Second edition, New Age International Publishers, 2010.
2. R.Panneerselvam, "Research Methodology", PHI, 2009.

Reference Books:

1. S.P.Gupta, Introduction to Mathematical Statics"
2. D.K.Bhattacharyya, "Research Methodology", First Edition, EBP, 2003.
3. Sancheti and Kapoor, "Business Statics".

MSU / 2016-17 / PG –Colleges / MCA / Semester -V/ Ppr.no.29 / Core - 20

Net Programming

UNIT- I

ASP.NET applications, ASP.NET file types – Three ways to code web forms – ASP.Net configuration web form fundamentals : A simple page applet – Improving the currency converter – A deeper Look at HTML control classes – The page Class.

UNIT- II

Web controls : Stepping up to web controls – Web control classes – Auto post back and Web control events – A simple web page applet – Assessing web controls.

UNIT- III

Validation and rich controls : The calendar control – Formatting the calendar – Restricting Dates – The AdRotator – The advertisement file – The AdRotator class validation – The validation controls – The validation process – The validator class – A simple validation example.

UNIT-IV

The data list : Data grid & repeater : Introducing Templates – Using Templates with the Data List – Data Binding with Multiple Templates – Comparing the Template Controls – Preparing your list for selection & Editing – Selecting Items – Editing Items – Paging & Sorting with the Data Grid.

UNIT- V

Overview of ADO.NET – Introducing ADO.NET and Data management – Characteristics of ADO.NET – The ADO.NET object model. ADO.NET Data Access : SQL Basics – The SQL select statement – The SQL update Statement – The SQL Insert statement – The SQL delete statement –Accessing, creating a connection – Defining a select command – updating data – Accessing Disconnected Data – Selecting Multiple Tables – Modifying Disconnected Data – Updating Disconnected Data.

Text & Reference Books:

1. ASP.NET – The complete reference – Matthew Mac Donald – Tata McGraw Hill 2005.
2. Rescued by Active server pages & ASP.NET – Rob Francis – Thomson Delmar Learning Edition 2005.

MSU / 2016-17 /PG –Colleges / MCA / Semester -V/ Ppr.no.30 / Core -21

Cloud Computing

UNIT – I

Cloud computing – An Overview : Introduction – History of cloud computing – Characteristics of cloud – Cloud computing model – Issues and challenges for cloud computing – Advantages and disadvantages of cloud computing – Security, Privacy and trust – Virtualization – Threats to cloud computing – Next generation of cloud computing.

Cloud computing Architecture: Introduction - Cloud Architecture – Cloud computing models – Comparisons of Service models - Deployment models – Identity as a service.

UNIT – II

Virtualization in Cloud : Virtualization – Implementation of Virtualization - Virtualization support at the OS level – Middleware support for Virtualization – Advantages of Virtualization – Application Virtualization - Virtualization implementation techniques – Hardware virtualization – Types of Virtualization – Load balancing in cloud computing – Logical cloud computing model – Virtualization for Data-centre.

Security Issues and challenges in Cloud computing: Introduction - Security challenges in Cloud computing – Information Security in Cloud computing – Security, Privacy and Trust.

Security Management : Introduction – Security in reference architecture – Security Issues in cloud computing – Classification of security issues – Types of attackers – Security risk in cloud computing – Security Threats against cloud computing – Novel security approaches – Emerging trends in security and privacy.

UNIT - III

Virtualization System specific Attacks : Attacks in cloud computing environment – Attacks in Hypervisor – Security challenges – Virtualization security solutions – Desktop virtualization Security – Planning and deployment for secure virtualization.

Web Services : Amazon web services – Microsoft Azure – Google App Engine

UNIT – IV

Service Oriented Architecture: SOA components – Design principles of SOA – SOA requirements – Benefits of SOA – Significance of SOA in cloud computing – Challenges associated with SOA – Enterprise Service Bus – Web Services – Recurring Architectural Capabilities.

Migrating Applications to the Cloud computing : Motivations for migration – Issues in migrating the applications to the cloud – Challenges in migrating the applications to the cloud – Solutions – Types of migration – Planning for migrating the application to the cloud – Migration Roadmap – Cloud bursting.

Cloud Computing Applications: Business applications – Finance and banking applications – Cloud computing in education.

UNIT – V

Standards in Cloud Computing : Standardization activities – Challenges – Fields of standardization – Role of Standards in cloud computing environment – Standardization organizations in Cloud Computing.

Mobile Cloud Computing : Needs of mobile Cloud Computing – Mobile Cloud Computing Architecture – Technologies for MCC – MCC Applications – Issues in MCC – Challenges in building applications – Platforms.

Micro services: Need of micro services – Micro service architecture – Benefits of Micro services – Drawbacks of micro services – Communication mechanisms – Decentralized data management - Essential check-lists for migration from monolithic to micro services - Comparison of Micro services with SOA.

Text book:

1. V.K.Pachghare, "Cloud Computing", PHI, 2016.

Reference Books:

1. Michael Miller, "Cloud Computing", Pearson Education, New Delhi, 2009
2. Anthony T.Velte,Toby J.Velte,Pobert Elsenpeter,"Cloud Computing",TMH,2010
3. Kumar Saurbh , "Cloud Computing – Insights into New-Era Infrastructure", Wiley India, 2011.
4. John W.Rittinghouse and James F. Ransome, "Cloud computing Implementation, Management and Security", CRC press, 2010.
5.. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From ParallelProcessing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
6. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, 'Mastering Cloud Computing",TMGH,2013.
7. Gautam Shroff,Enterprise Cloud Computing,Cambridge University Press,2011

MSU / 2016-17 / PG –Colleges / MCA / Semester –V / Ppr.no.31 / Elective – III & IV (a)

Big Data Analytics

UNIT- I INTRODUCTION TO BIG DATA

Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT- II MINING DATA STREAMS

Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing -Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT- III HADOOP

History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing theData with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFSBasics- Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features.

UNIT- IV HADOOP ENVIRONMENT

Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation – Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS – Monitoring – Maintenance-Hadoop benchmarks- Hadoop in the cloud.

UNIT- V FRAMEWORKS

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services –HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphere BigInsights and Streams. Visualizations - Visual data analysis techniques, interaction techniques;Systems and applications

Reference Books:

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Tom White “ Hadoop: The Definitive Guide” Third Edition, O’reilly Media, 2012.
3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, “Understanding BigData: Analytics for Enterprise Class Hadoop and Streaming Data”, McGrawHill Publishing,2012
4. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, CambridgeUniversity Press, 2012.
5. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streamswith Advanced Analytics”, JohnWiley & sons, 2012.
6. Glenn J. Myatt, “Making Sense of Data”, John Wiley & Sons, 2007
7. PeteWarden, “Big Data Glossary”, O’Reilly, 2011.
8. Jiawei Han, Micheline Kamber “Data Mining Concepts and Techniques”, Second Edition,Elsevier, Reprinted 2008.
9. Da Ruan,Guoquing Chen, Etienne E.Kerre, GeertWets, Intelligent Data Mining, Springer,2007
11. Michael Minelli (Author), Michele Chambers (Author), Ambiga Dhiraj (Author) , Big Data, BigAnalytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses,WileyPublications,2013

MSU /2016-17 / PG –Colleges / MCA / Semester -V/ Ppr.no.31 /Elective – III & IV (b)

Embedded Systems

UNIT- I INTRODUCTION TO MICROPROCESSORS
Evolution Of Microprocessors - 8-Bit Processor - 8085 Architecture – Register Organization - Instruction Set – Timing Diagram- Addressing Modes – Interrupts- Interrupt Service Routines-Assembly Language Programming Using 8085

UNIT- II INTRODUCTION TO EMBEDDED SYSTEMS
Embedded Systems- Processor Embedded Into A System-Embedded Hardware And Software Units-Applications-Design Process – Intel 8051 Architecture- Processor And Memory Organization-Interrupts Of 8051 - Assembly Language Programming Using 8051

UNIT- III INTERFACING WITH 8051 Input-Output Interfacing – Bus Standards – PCI – ISA – Timing And Control – Input Output Devices –Serial And Parallel Communication – Motor Control-Programming Display Devices – ARMArchitecture

UNIT- IV REAL–TIME OPERATING SYSTEM
Inter Process Communication – Signal Functions – Socket Programming – Mailbox - Pipes – RTOS – OS Services – Process Management - Timer Function –Event Function – Memory Management –Device, Files And I/O Subsystem – Basic Design Of RTOS.

UNIT -V RTOS PROGRAMMING
Basic Functions – Types of RTOS – RTOS μCOS – RTLinux – Real Time Linux Functions-Programming With RTLinux – Case Study.

Reference Books:
1. Rajkamal, "Embedded System: Architecture, Programming And Design" Tata Mcgraw-Hill Education, Second Edition, 2008.
2. B.Kanth Rao, "Embedded Systems" PHI Learning Private Limited, 2011.
3. Marilyn Wolf, "Computers As A Components" Third Edition, Morgan Kaufmann Series 2012.
4. A.P.Godse & A.O.Mulani "Embedded Systems" Third Edition, Technical publications 2009.
5. Mohamed Rafiquzzaman, "Microprocessors and Micro computer-based system design", CRC Press, Second Edition, 2013.

MSU / 2016-17 / PG –Colleges / MCA / Semester -V/ Ppr.no.31 / Elective – III & IV (c)

Data Mining

UNIT-I

Introduction : Basic Data Mining Tasks – Data Mining Versus Knowledge Discovery in Databases – Data Mining Issues – Data Mining Metrics – Social Implication of Data Mining – Data Mining from a Data base Perspective. Data Mining Techniques : A Statistical Perspective on Data Mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

UNIT- II

Classification : Introduction – Statistical – Based Algorithms – Distance – Based Algorithms – Decision Tree – Based Algorithms – Neural Network – Based Algorithms – Rule Based Algorithms – combining Techniques.

UNIT III

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms – Partitional Algorithms – Clustering Large Databases – Clustering with Categorical Attributes.

UNIT -IV

Association Rules: Introduction – Large Itemsets – Basic Algorithms – Parallel and Distributed Algorithms – Comparing Approaches – Incremental rules – Advanced Association Rule Techniques – Measuring the Quality of Rules.

UNIT - V

Web Mining : Introduction – Web content Mining – Web structure Mining – Web usage mining Spatial Mining : Introduction – Spatial Data Overview – Spatial Data Mining Primitives – Generalization and Specialization – spatial rules – Spatial Classification Algorithms – Spatial Clustering Algorithms.

Text Book :

1. Marget H. Dunham, “Data Mining Introductory and Advanced Concepts”, Pearson Eduction 2003.

Digital Image Processing

UNIT -I

Introduction :-Fundamentals-The MATLAB Desktop-Using Mat lab Editor Debugger-getting help-saving and Retrieving work session data-Digital Image Representation-Image I/O and Display –Classes and Image Types-M-Function Programming.
305 Intensity Transformation and Spatial Filtering: - Background-Intensity transformation - histogram processing and function Plotting-Spatial filtering-Image processing toolbox standard spatial filters.

UNIT - II

Filtering in Frequency Domain:-The 2-D Discrete Fourier transform-Computing and Visualizing the 2-D DFT in MATLAB – Filtering in the Frequency domain- Obtaining frequency domain filters from spatial filters- Generating filters directly in the frequency domain-sharpening frequency domain filters. Image Restoration and Reconstruction:- A model of the image degradation / restoration process- noise models- Restoration in the presence of noise only-Spatial filtering- periodic noise reduction by frequency domain filtering- Modelling in degradation function-Direct inverse filtering –wiener filtering-Constrained least squares filtering – Iterative non-linear restoration using the lucy - Richardson algorithm- Blind deconvolution - Geometric transformation and image registration.

UNIT -III

Color image processing:- Colour image representation in matlab-converting to other color spaces-The basics of color image processing-Color transformation-spatial filtering of colour images-Working directly in a RGB vector space Wavelets:-Background - The fast wavelet transform-working with wavelet decomposition structures-the inverse wavelet transform-wavelets in image processing.

UNIT -IV

Image compression:-Background-coding redundancy-spatial redundancy-irrelevant information-jpeg compression Morphological image processor:-preliminaries-dialation and erosion-combining dialation and erosion-labelling connected components –morphological reconstruction-gray scale morphology 306

UNIT-V

Image segmentation:- Image segmentation-point, line and edge detection-Line detection using the hough transform-thresholding-region-based segmentation using the watershed transform Representation and description:-Background-Representation-Boundary descriptors- regional descriptors using principal components for descriptors.

Reference Books:

1. Rafael C.Gonzalez, Richard E.Woods, Steven L.Eddins, Image Processing Using MATLAB,Second edition, Tata McGraw Hill Education Private Limited,New Delhi.
2.Anil.K.Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1989.
3.Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall ,3rd Edition
4.S.Sridhar, Digital Image Processing,Oxford University Press 2011

E - Commerce

UNIT-I

History of E-commerce: Advantages of E-Commerce - Disadvantages of E-commerce - Transition to E-commerce in India - Some Pioneering Indian case studies. Business model for E-commerce - E-business model based on relationship of transaction parties - E-Business model based on the relationship of transaction types.

UNIT-II

E-marketing: Traditional marketing - Identifying web presence goals - The browsing behavior model-online marketing - E-Advertising - Internet marketing trends - Target markets - Marketing strategies.

UNIT-III

E-payment system: Digital payment requirements, Digital toke based E-payment system - Classification of new payment system - Properties of electronic cash-cheque payment systems on internet - Risk and E-payment systems-Designing E-payment systems - Digital Signature.

UNIT-IV

E-customer relationship management: Customer relationship management - E-supply chain (Benefits, E-supply chain architecture, Major Trends in E-SCM).

UNIT-V

Mobile commerce: Growth of mobile commerce - Technologies for Mobile commerce-Wireless technologies - Mobile commerce - Intelligent web design - Requirement of intelligent web sites - Setting web sites goals and objectives - Anand online and offline model.

Text &Reference Books:

1.E-Commerce – A Managerial perspective – P.T.Joseph, Prentice Hall of India (P)Ltd., 2002.
2.E-Commerce – David Whitley, Tata McGraw Hill Edition,2005.
3.Frontiers of Electronic Commerce – Kalkota and Whinston, Pearson Education, 2004.
4.E-Commerce-Gray P.Schneider, Thompson Cour4se Technology, 2004.
5.E-Business, Parag Kulkarni, Sunita Jahirabadkar, Pradip Chande, Oxford University Press.

MSU / 2016-17 / PG –Colleges / MCA / Semester -V/ Ppr.no.32 / Practical - IX

Net Programming Lab

1. Case conversion
2. Current Data and time
3. Rupees conversion
4. Changing background colour
5. Checklist program using web server controls
6. Table creation
7. Control being monitored for change event
8. Greeting card creation
9. Range validator
10. Server validation
11. Compare validation
12. Calandar Control
13. Creating Advertisement using AdRotator class

Practical

Major Project