UNIVERSITY OF MYSORE

SYLLABUS AND REGULATIONS

for

M. Sc IN INFORMATION TECHNOLOGY

Choice Based Credit System

Effective from the Academic year 2017-18

UNIVERSITY OF MYSORE
Regulations for the M. Sc in INFORMATION TECHNOLOGY
(Semester Scheme - Choice Based Credit System)
(Effective from Academic year 2017-18)

Title of the course: Master of Science in Information Technology

Regulations: The existing regulations governing the Postgraduate Degree (Science) courses of the University of Mysore are applicable to this course.

Eligible for admission: B. Sc degree with Computer Science or Mathematics as one of the optional/ Any degree with Diploma in Computer Application/ B.C.A/ B.Tech/ B.E in any discipline with minimum of 45% marks in aggregate (40% in case of SC/ST and Cat-1). The selection of candidates for this course will be based on an entrance test.

Duration: Two years (Four Semester)

LIST OF PAPERS

Semester I

Paper	Title	Theory classes/week (Hours)			Total no. of credits	Assignment / Record marks	Exam Marks	Total Marks
		L	T	P				
MSCIT 101 HC	Computer Organisation and Architecture	2	1	0	3	30	70	100
MSCIT 102 HC	Problem Solving and programming in C	2	1	1	4	30	70	100
MSCIT 103 HC	Data Structures and Algorithms	2	1	1	4	30	70	100
MSCIT 104 HC	Discreet Mathematics	2	0	2	4	30	70	100
MSCIT 105 SC	Computer Graphics	2	0	1	3	30	70	100
MSCIT 106 SC	Internet Technologies	2	0	1	3	30	70	100
MSCIT 107 SC	E-Commerce	2	1	0	3	30	70	100
					24			

Semester II

Paper	Title	Theory classes/week (Hours)			Total no. of credits	Assignment/ Record marks	Exam Marks	Total Marks
		L	T	P				
MSCIT 201 HC	RDBMS and Query Languages	2	0	1	3	30	70	100
MSCIT 202 HC	Data Communication and Computer Networking	2	1	1	4	30	70	100
MSCIT 203 HC	Current Operating Systems and their Applications	2	0	1	3	30	70	100
MSCIT 204 HC	Object Oriented Programming in C++ and JAVA	2	1	1	4	30	70	100
MSCIT 205 SC	Probability and Statistics	2	1	0	3	30	70	100
MSCIT 206 SC	Multimedia Technologies	2	0	1	3	30	70	100
MSCIT 207 SC	ERP	2	1	0	3	30	70	100
OPEN ELECTIVE	Web Designing	2	0	1	3			
					26			

Semester III

Paper	Title	Theory classes/week (Hours)			Total no. of credits	Assignment/ Record marks	Exam Marks	Total Marks
		L	T	P				
MSCIT301 HC	Web Technologies	2	1	1	4	30	70	100
MSCIT302 HC	Software Engineering and Testing	2	1	0	3	30	70	100
MSCIT303 HC	Mobile Computing and Application	2	0	1	3	30	70	100
MSCIT304 HC	Advanced JAVA	2	0	2	4	30	70	100
MSCIT305 HC	Data Mining and Warehousing	2	1	0	3	30	70	100
MSCIT306 SC	Software Project Management	2	1	0	3	30	70	100
MSCIT307 SC	Cyber Laws & Network Security	2	1	0	3	30	70	100
OPEN ELECTIVE	Mobile Technology	2	1	0	3			
					26			

Semester IV

Paper	Title	Theory classes/week (Hours)			Total no. of credits	Assignment/ Record marks	Exam Marks	Total Marks
		L	**T**	**P**				
MSCIT401 HC	Cloud Computing	2	0	1	3	30	70	100
	Elective paper (any one)							
MSCIT 402 SC	Programming with C Sharp (C#)	2	0	1	3	30	70	100
MSCIT 403 SC	Software Communication & Documentation	2	1	0	3	30	70	100
MSCIT 404 SC	Geographic Information Systems	3	0	0	3	30	70	100
Project HC	Project	0	2	6	8	60	140	200
OPEN ELECTIVE	Multimedia Applications	2	1	1	4			
					24			

SEMESTER-I

MSC IT 101 Hard Core Paper: COMPUTER ORGANISATION AND ARCHITECTURE

Unit I:

Basic of Computer, Generation of Computer, Classification of Computers, data types, Von Neumann Architecture, Instruction Execution, Register Transfer, Bus and Memory Transfers, Tree-State Bus Buffers, Memory Transfer, Micro-Operations, Register Transfer Micro-Operations, Arithmetic Micro-Operations, Logic Micro-Operations, Shift Micro-Operations.

Unit II:

Addition And Subtraction With Signed-Magnitude, Multiplication Algorithm, Division Algorithm, Floating-Point Arithmetic Operations, ALU, Input and Output Devices, Punched Tape, Computer registers, computer instructions, Timing and Control, Instruction cycle, Central Processing Unit, Processor bus organisation, stack organisation, instruction formats-three address, two address, single address and zero address instruction formats, addressing modes, data transfer and manipulation, RISC and CISC machine characteristics.

Unit III:

Memory Hierarchy, Main Memory, Auxiliary Memory, Cache Memory, Virtual Memory. Address Space and Memory Space, Associative Memory, Page Table, Page Replacement. Characteristics of Multiprocessors, Interconnection Structure Time-Shared Common Bus, Multi-Port Memory, Crossbar Switch, Derivation of a Boolean Expression - Sum Products, Product of Sums".

Unit IV: Parallel organization: Types of Parallel processor systems, Pipelining, Clusters: Cluster configurations, mainframe and mini computers, wearable computers, handheld computers. I pod, Configuration and features of Laptops. The future of computer architecture.

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REFERNECE BOOKS:

1. “Computer Organization and Design: The Hardware/Software Interface” by David A. Patterson and John L. Hennessy
2. “Computer Organization” by Carl Hamachar, Zvonco Vranesic and Safwat Zaky
3. “Computer Architecture and Organization” by John P. Hayes
4. “Computer Organization and Architecture: Designing for Performance” by William Stallings
5. “Computer Systems Design and Architecture” by Vincent P. Heuring and Harry F. Jordan
6. "Digital Computer Fundamentals" - Thoruas C. Bartee, Tata McGraw Hill, 1996.
7. Computer System Architecture, Mano MJ\1, 1993. Prentice-Hall of India.Tlnd edition,
8. Computer Organization and Architecture - Designing For Performance, Stallings William, Prentice-Hall of India Private Limited, 2000, Delhi

9. Modern Computer Architecture, Rafiquzzamam Mohamed & Chandra Rajan, Galgotia Publications Pvt.Ltd, 1999, New Delhi
10. Computer Systems -Design and Architecture, Heuring Vincent P & Jordan Harry E, Pearson Education Asia, 2004, New Delhi

MSC IT 102 Hard Core Paper: Problem Solving and Programming in C.

Unit-I:

Introduction, History, Structure of C, Compiling a C program, Compiler & interpreters, Program Execution of C Program, Variables and Keywords: Character Set, Identifier, Variable, Keywords, Escape Sequence Characters, Constants: Real Constant, Integer Constant, Character Constant, String Constant, Data Types: Data Types, Qualifier, Enum, Typedef, Operators: Assignment Operator, Arithmetic Operators, Logical Operators, Relational Operators, Shorthand Operators, Unary Operators, Conditional / Ternary Operator, Bitwise Operators, Operator Precedence and Associativity, If Statement, If-Else Statement, Nested If-Else, Switch Case.

Unit II:

Looping / Iterative Statements, while, do while, for loop, Break Statement, Continue Statement Goto, Functions: Function call by passing value, Function call by returning value, Function call by passing and returning value, Recursion, Storage Classes, Automatic Storage Class (auto), Register Storage Class (register), Static Storage Class (static), External Storage Class (extern).

Unit III:

One dimensional arrays: array manipulation; searching, insertion, deletion of an element from an array; finding the largest/smallest element in an array; two dimensional arrays, addition/multiplication of two matrices, pointers, pointer declaration, structure, union, difference between structure and union, strings, header files: header file: assert.h, ctype, math.h, process.h, string.h, time.h, namespaces and exceptions namespaces exceptions.

Unit IV:

Functions: Top-down approach of problem solving, modular programming and functions, standard library of c functions, prototype of a function: return type, function call, block structure, passing arguments to a function: call by reference, call by value, recursive functions, arrays as function arguments, concept of files, file opening in various modes and closing of a file, reading from a file, writing onto a file.

Reference Books:

1) C Programming Language (2nd Edition By B. W. Kernighan & D. M. Ritchie)
2) C Programming: A Modern Approach, 2nd Edition By K. N. King
3) C Primer Plus, 5th Edition By Stephen Prata
4) Expert C Programming: Deep C Secrets By Peter V. Linden

5) Programming with C -Second Edition, Gottfried Byron, Tata McGraw- Hill Publishing Company Limited, *2001,* New Delhi .
6) Programming in C , Ravichandran, D, New Age International (P) Limited, Publishers, 2001, New Delhi.
7) C. Programming Language, Kernighan Brian W & Ritchie Dennis M, Prentice - Hall of India Private Limited, 2004, New Delhi .
7) Programming in C, Gottfried Bryon, McGraw- Hill Publishing Company Limited, *2004,* New Delhi.

MSC IT 103 Hard Core Paper: Data Structures and Algorithms

UNIT I:

Data Structures: Introduction to Data Structures, Arrays and Strings, Data types, Identifiers, Keywords, constants: String constants Numeric constants Character constants, Pre and post Condition, primitive and non primitive, Declaring and initializing pointers, Meaning of static and dynamic memory allocation. Memory allocation functions: malloc, calloc, free and realloc.

UNIT II:

Linked Lists: Operation, Creations, insertion, Deletion, Singly lists, Circular Lists, Doubly Linked List, Sorting: Insertion Sort, Merge Sort, Quick Sort. Searching: Binary Search, Selection, Graphs I: Representation, Depth First Search, Breadth First Search, Minimum Spanning Tree, Shortest Path. Tree: Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology : Root, Node, Degree of a node and tree, Terminal nodes, Non terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder.

UNIT III:

Stacks: Operations on Stacks: Push & Pop, Array Representation of Stack, Operations Associated with Stacks, Applications of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack, Queues: Operations and Applications, Double Ended Queues: Operations and Applications, Circular Queues: Operations and Applications. Basic Search Techniques: Search algorithm searching techniques: sequential search, Binary search

Unit IV:

Algorithm, Flowchart, Complexity analysis Compilation Algorithms in Computing, Analyzing algorithms, Designing algorithms, divide and conquer, The greedy method, Kruskal's algorithm, 'Tower of Hanoi', back tracking, Applications of algorithms in scientific and engineering computations.

Reference Books:

1) Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., New Delhi.
2) 2. R. Kruse etal, "Data Structures and Program Design in C", Pearson Education Asia, Delhi- 2002
3) A. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.
4) K Loudon, "Mastering Algorithms with C", Shroff Publisher & Distributors Pvt. Ltd.
5) Bruno R Preiss, "Data Structures and Algorithms with Object Oriented Design Pattern in C++", Jhon Wiley & Sons, Inc.
6) Adam Drozdek, "Data Structures and Algorithms in C++", Thomson Asia Pvt. Ltd.(Singapore)

MSC IT 104 Hard Core Paper: Discreet Mathematics

UNIT 1:

Set Theory: Definition of Sets, Venn Diagrams, complements, Cartesian products, power sets, counting principle, cardinality and countability (Countable and Uncountable sets), proofs of some general identities on sets, pigeonhole principle. Relation: Definition, types of relation, composition of relations, domain and range of a relation, pictorial representation of relation, properties of relation, partial ordering relation. Function: Definition and types of function, composition of functions, recursively defined functions.

UNIT II:

Combinatories: Mathematical induction, recursive mathematical definitions, basics of counting, permutations, combinations, inclusion-exclusion, recurrence relations (nth order recurrence relation with constant coefficients, Homogeneous recurrence relations, Inhomogeneous recurrence relation), generating function (closed form expression, properties of G.F., solution of recurrence relation using G.F, solution of combinatorial problem using G.F.)

UNIT III:

Permutations and Combinations: Permutations, Combinations, Repetitions. Definitions of functions - Classification of functions -Type of functions - Examples - Composition of

functions - Inverse functions - Binary and unary operations. - Characteristic function of a set: Hashing functions - Recursive functions - Permutation functions. Functions-Plain and One-to-One, Onto Functions, Stirling Numbers and the Second Kind, Special functions, Function composition and inverse functions.

UNIT IV:

Graph, graph models, Graph terminology and special types of graphs-Matrix representation of graph and graph isomorphism- connectivity-Euler and Hamilton paths. Algebraic systems: Semi groups and monoids-Groups-Subgroups and homomorphisms-Cosets and Lagrange's theorem- Ring & Fields (Definitions and examples).

Reference books:

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Mc.Graw Hill, 2002.
2. J.P.Tremblay & R. Manohar, "Discrete Mathematical Structure with Applications to Computer Science" Mc.Graw Hill, 1975.
3. V. Krishnamurthy, "Combinatories:Theory and Applications", East-West PressG
4. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, "Discrete Mathematical Structures", Fourth Indian reprint, Pearson Education Pvt Ltd., New Delhi, 2003. 2. Kenneth H.Rosen, "Discrete Mathematics and its Applications", Fifth Edition, Tata McGraw – Hill Pub. Co. Ltd., New Delhi, 2003. 3. Richard Johnsonbaugh, "Discrete Mathematics", Fifth Edition, Pearson Education Asia, New Delhi, 2002.
5. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, (2002).
6. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications, (2006).
7. Seymour Lipschutz and Mark Lipson,"Discrete Mathematics", Schaum's Outlines, Tata McGraw-Hill Pub. Co. Ltd., New Delhi, Second edition, (2007).

MSC IT 105 SOFTCORE: Computer Graphics

UNIT-I

Introduction: computer Graphics, Area of Computer Graphics, Design and Drawing, Overview of graphic systems- Video display devices, Raster scans systems, Graphic monitors and workstations output primitives – Line, Circle and Ellipse drawing algorithms - Attributes of output primitives – Two dimensional Geometric transformation - Two dimensional viewing – Line, Polygon, Curve and Text clipping algorithms.

UNIT-II

Simple line drawing methods: point plotting techniques, qualities of good line drawing algorithms, bresenham's algorithm, and generation of circles: two dimensional

transformations and clipping and windowing. Matrix representation of points, basic transformation, need for clipping and windowing, line clipping algorithms, the midpoint subdivision method, other clipping methods, sutherland – hodgeman algorithm, viewing transformations. Basic Graphics Pipeline, Bitmap and Vector- Based Graphics.

UNIT-III

Scan-Conversion of a Lines (Digital differential analyzer algorithm), scan- conversion of circle and ellipse (bresenham's method of circle drawing, midpoint circle algorithm), Drawing ellipses and other conics. Curves and surfaces: shape description requirements, parametric functions, bezier methods, bezier curves, bezier surfaces, b-spline methods solid area scan conversion.

UNIT-IV

Three Dimensional Transformations Solid Area Scan Conversion, Scan Conversion of Polygons, Algorithm Singularity, Translations, Scaling, Rotation, Viewing Transformation, The Perspective, Algorithms, Three Dimensional Clipping, Perspective view of Cube. Hidden surface removal: Need for hidden surface removal, The Depth - Buffer Algorithm, Properties that help in reducing efforts, Scan Line coherence algorithm, span – Coherence algorithm, Area-Coherence Algorithms, Warnock's Algorithm, Priority Algorithms.

Books:

1. "CAD/CAM and Practice" by Ibrahim Zeid
2. "Computer Graphics" by John F. Hughes
3. Hearn and Baker, *Computer Graphics,* C Version, 2nd ed. ISBN 0-13-530924-7.
4. Donald Hearn, M. Pauline Baker, Computer Graphics, 2nd edition, C version, Prentice Hall, 1996.
5. Angel, Interactive Computer Graphics. ISBN 0-201-85571-2.

MSC IT 106 Soft Core: Internet Technology

Unit-I

Introduction: History of data networking, evolution of the Internet, terminology, circuit vs. packet switching, delays OSI Model, TCP/IP Protocol Suite, Network Layer, IPV 4 and IPV6 Addresses and Protocol. Network protocol stack, sockets, network programming, threads & concurrency, mutual exclusion HTML 5.0, PHP, AJAX and RSS, Working principle of search engine.

Unit-II

Understanding IPv6, CIDR, Hierarchical Routing, Routing Protocol over internet. Multimedia over Internet, Voice over IP, Virtual Private networkTransport Layer, User Datagram Protocol (UDP), Transmission Control Protocol(TCP), Stream Control Transmission Protocol (SCTP).

Unit-III Host Configuration: DHCP, Domain Name System (DNS), Remote Login: TELNET and SSH, File Transfer: FTP and TFTP. Architecture of the web, Networking fundamentals, Dynamic web sites: Client Side: Java Script, Server Side: CGI, Perl, Java Servlets and Server Pages.

Unit-IV

World Wide Web and HTTP, Electronic Mail: SMTP, POP, IMAP and MIME, Network Management: SNMP, Multimedia. Client Server Programming: Concurrent Connection Oriented (TCP) and Connectionless programming (UDP), Iterative connectionless (TCP) and connection oriented servers (UDP).

Reference Books:

1. TCP/IP Protocol Suite, Behrouz A. Forouzan, 4th Edition , TMH.
2. Computer Networks and Internets with Internet Applications (Third Edition)
3. HTML for the World Wide Web with XHTML and CSS: Visual QuickStart Guide, Fifth Edition
4. Internetworking with TCP/IP, Volume I, Fifth Edition, Douglas E. Comer, PHI
5. Internetworking with TCP/IP, Volume II, Third Edition, Douglas E. Comer, D.L. Stevens,PHI
6. TCP/IP Illustrated, Eastern Economy Edition,N.P. Gopalan, B.Siva Selvan, PHI

MSC IT 107 Soft Core: E-Commerce

UNIT 1

Introduction to E-commerce, Evolution of E-commerce: Introduction, History of Electronic Commerce, Advantages and Disadvantage of E-commerce, E-commerce Infrastructure, An Overview, Hardware, Server Operating System, Software, Network Website.

UNIT 2

E-Commerce Process Models: Introduction, Business Models, E-business Models Based on the Relationship of Transaction Parties, e-commerce Sales Life Cycle (ESLC) Model. Designing web sites, The Life Cycle of Site Building-From Page to Stage, Building a Web Site, Web-Based Business-to-Business, E-Commerce, B2B Models, B2B Tools.

UNIT 3

Payment system: From Barter to Money, Requirements for Internet-Based Payments, Electronic Payment Media, Credit cards, Debit cards, Smart cards, Digital Signature. E-Marketing: The scope of E-Marketing, Internet Marketing Techniques.

UNIT 4

Security in cyberspace, designing for security, How Much Risk Can You Afford, The Virus: Computer enemy Number one, security Protection and Recovery. Marketing on the Internet, Online Shopping, Internet Marketing Techniques. The E-Cycle of Internet Marketing, attracting customers to your site.

REFERENCE:

1. Internet Commerce: Digital Models for Business, Lawrence et al, Wiley
2. Electronic Commerce: A Manager's Guide, Kalakota et al, Addison-Wesley
3. Frontiers of Electronic Commerce, Kalakota et al, Addison-Wesley
4. Web Commerce Technology Handbook, Minoli et al, McGraw Hill
5. The Economics of Electronic Commerce, Choi et al, MacMillan
6. Designing Systems for Electronic Commerce, Treese etal, Addison-Wesley

SEMESTER II

MSC IT 201 Hard core: RDBMS and Query Languages

Unit-I:

DBMS an overview, Advantages of DBMS, Network, Hierarchical and Relational Model, Entity Relationship Model, Entities, Attributes and Entity Sets, Features of E-R Model, An Overview of DBMS: Introduction to Database Management systems; Data Models; Database System Architecture; Relational Database Management systems, Integrity constraint, Enforcing Data Integrity, Introduction to views; Partial Dependencies. Entity Relationship Model, Entities and Attributes.

Unit-II:

SQL commands, Data Definition Language Commands, Data Manipulation Language Commands, Data types, modifying the structure of the table. Viewing The Data, Computations on Table Data, Arithmetic Operators; Logical Operators, Comparison Operators, Aggregate operator, Oracle functions.

Unit-III:

Joins: Equi Joins, Non Equi Joins, Self Joins, Outer Joins. Using Set Operators- Union, Intersect; Minus. Views and Indexes: Definition and Advantages Views, Creating and Altering Views, Using Views, Indexed Views, Definition and Advantages of Indexes. Database Objects: Sequences, Creating Sequences; Referencing Sequences; Altering a Sequence; Dropping a Sequence

Unit-IV:

Introduction to PL/SQL.: Advantage of PL/SQL; The Generic PL/SQL Block; The Declaration Section; The Begin Section; The End Section; PL/SQL Data types. Logical Comparison; Conditional Control in PL/SQL; Iterative Control; Advanced PL/SQL : Types of Cursors; Implicit Cursor; Explicit Cursor; Explicit Cursor attributes; Cursor For Loop; Parameterized Cursor; Error Handling in PL/SQL.

Reference Books:

1. An introduction to Database Systems : Bipin C. Desai, Galgotia Poblications Pvt. Ltd.
2. Ivan Bayross : SQL,PL/SQL The programming language of Oracle, 3rd revised edition, BPB Publications
3. Kevin Loney, George Koch, Orale9i The Complete Reference , Oracle Press

4. P. S. Deshpande : SQL/PLSQL for Oracle9i, dreamtech press, reprint edition 2009
5. Oracle PL/ SQL Programming, Feuerstein Steven With Pribyl Bill, Shroff Publishers & Distributors Pvt. Ltd, 1999, Calcutta
6. The Complete Reference My SQL, Vaswani Vikram, and Tata McGraw-Hill Publishing. Company Limited, 2004, New Delhi

7. Database Management Systems, Majumkar Arun K &.Bhattacharyya Pritirnoy, Tata McGraw-Hill Publishing Company Limited, 2003, New Delhi
8. Introduction to Data Base Management, Prakash Naveen, Tata McGraw- Hill Publishing Company Limited, 2001, New Delhi

MSC IT 202: DATA COMMUNICATION AND COMPUTER NETWORKING

Unit-I:

Introduction to networking, OSI Model for Networking, Internet, ATM Network Components (Cables, Hubs, Bridges, Switches, Routers), Network Topologies, Shared Medium, Peer to Peer, Hybrid Technology. Multiplexing, Signaling, Encoding & Decoding, Error Detection & Recovery, Flow Control, Sliding Window, Congestion Management.

Unit-II:

Network technologies: Local Area Network Technologies, Ethernet Technologies, Ethernet Versions, Token Ring Technologies, Wide Area Network Technologies, Wireless Networks ,Radio Frequencies, Microwave Frequencies, Infrared Waves. Web Security, Email. Bridges and switches. Hierarchical naming, Addressing, Telephone networks

Unit-III:

Design Issues, Distributed & Centralized Design, Circuit Mode & Packet Mode Design, Implementation Issues, Performance Considerations, Base Technology. Distributed Access , decentralized polling, *CSMA/CA,* CSMA/CD, Busy Tone Multiple Access & Multiple Access Collision Avoidance. Principles of inter networking, architectures, addressing and protocols. Particular reference to IPv4, IPv6, TCP and UDP.

Unit –IV :

Internet IPv4, IPv6, subnetting , Private Networks, Asynchronous transfer mode, Name resolution , Address resolution protocol , Routing Information, Routing Protocols, Hierarchical Routing. SWITCHING: Circuit Switching (Time division switching Space division switching, Time space switching , time space time switching) packet switching, port Mappers Blocking , ATM Switching.

Reference Books:

1. Data And Computer communications Stallings William, Prentice-Han of India Private Limited, 1997, New Delhi

2. Computer Networks And Communication, Jain. YK. & Baj~j Naveena, Cybertech Publications, 2001, New Delhi
3. Local Area Network, Bridges Stcphen.Pjvl., Galgotia Publications Pvt. Ltd, 1996, New Delhi
4. Networking Programme For 1\/18 Windows, Jones Anthony & Ohlund Jim. Wp Publishers & Distributors *(P)* Ltd, 2000, Bangalore
5. Designing TCP;}P Ll1ternefworks, Bennet Geoff, Galgotia Publications Pvt.Ltd, *1998,* New Delhi
6. Computer Networking With Internet Protocols A .. nd Technology, Stallings William-, Pean,on Education Asia, 2004, New Delhi
7. Data And Computer Conununications, Stallings William, Prentice Hall of India Private Limited, 2003, New Delhi.
8. Data Communicat.ions And Distributed Newtorks, Black Uyless D, Prentice Hall of India Private.Limited, 2000, New Delhi
9. Data Communications & Networking, Forouzan Behrouz A, Tata Mcgraw-Hill Publishing Company Limited, 2004, New Delhi
10. Data Communications And Networks, Godbo1e Achyut S, Tat .Mcgraw-Hill Publishing
11. Company Limited, 2004, New Delhi .
12. Computer Networks, Tanenbaum A .... ndrew S, Prentice Hall of India Private Limited, 2004, New Delhi
13. 12 Managjng & Maintaining Exchange Server 5.5, Microsoft Corporation, Prentice Hall Of India Private Limited, 0, New Delhi
14. Managing and maintaining Exchange Server 5.5, Microsoft Corporation, Prentice Hall

M. Sc IT 203 Hard Core: Current Operating Systems and their applications

UNIT-I

Overview of operating systems, functionalities and characteristics of OS, Hardware concepts related to OS, CPU states, I/O channels, memory hierarchy, microprogramming, The concept of a process, operations on processes, process states, concurrent processes, process control block, process context, Time-sharing, multiprocessing, real time, distributed and modern operating systems, Desktop Systems, Handheld Systems, Clustered Systems, Assemblers, Compilers and Interpreters, Linkers.

UNIT-II

Job and processor scheduling, scheduling algorithms, process hierarchies. Mutual exclusion, process co-operation, producer and consumer processes. Semaphores: definition, init, wait, signal operations. Use of semaphores to implement mutex, process synchronisation etc., implementation of semaphores**.** Operating-System Services, User Operating-System**,** Interface, System Calls, Types of System Calls, System Programs.

UNIT-III

Processes and Process Synchronization**:** Process Concept, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Operations on Processes, Interprocess Communication, Multithreading Models, Threading Issues, Thread Scheduling, Communication in Client–Server Systems, The Critical-Section Problem, Peterson's Solution, Semaphores.

UNIT-IV

Memory Management**:** Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot.

Memory management without swapping or paging; Swapping, Virtual Memory, Page replacement algorithms, Modeling paging, algorithms, Design issues for paging systems, segmentation.

Reference Books:

1. Modern Operating Systems, Andrew Tanenbaum,
2. Operating Systems, 2nd Edition, K. A.Sumitra Devi and N.P Banashree, SPD
3. *Operating System Concepts*, 8th Edition, Abraham Silberschatz, Peter B.Galvin, Greg Gagne, Wiley publication
4. Operating Systems- A concept based approach , 2nd Edition, D.M. Dhamdhere, McGrawHill
5. Operating Systems, 3rd Edition , Godbole and Kahate, McGrawHill publications.
6. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts. Sixth edition. Addison-Wesley (2003).

MSC IT 204 Hard Core Paper: Object Oriented Programming in C $^{++}$ & JAVA

Unit-I:

Introduction, need of object oriented Programming characteristics of object-oriented languages C and C++. Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication); Benefits of OOP; Applications of OOP, Output using cout, Directives, Input with cin, Type bool. Type conversions, Writing a Program in C^{++}: Declaration of variables, Statement Simple Programs, Features of I/O stream. Keyboard and screen, Manipulator Functions, Predefined manipulators, Input and Output (I/O) Stream Flags.

Unit-II:

Returning values from functions, Reference arguments, Overloaded function. Inline function, Default arguments, returning by reference. core object concepts (Encapsulation, Abstraction, Polymorphism, Classes, Messages Association, Interfaces) Implementation of class in C++, C++ Objects as physical object, C++ object as data types constructor. Object as function arguments. The default copy constructor, returning object from function, Structures and classes, Classes objects and memory static class data.

Unit-III:

Overloading unary operations, Overloading binary operators, data conversion, pitfalls of operators, overloading and conversion keywords. Explicit and Mutable, Concept of inheritance. Derived class and based class. Derived class constructors, member function, Virtual Function, friend function, Static function, Assignment and copy initialization, this pointer, dynamic type information. Function templates, Class templates Exceptions. JAVA EVOLUTION:- Java History; Java Features, The Java Virtual Machine, Variables and data types, Conditional and looping constructs, Arrays, operators and expression.

Unit-IV:

Fields and Methods, Constructors, Overloading methods, Garbage collection, Nested classes, Overriding methods, Polymorphism, Making methods and classes final, Abstract classes and methods, Interfaces, The Object class: Cloning objects, The JDK Linked List class, Strings, String conversions, Packages, Applets**.**

Books:

1. Object Oriented Programming in C++ by Robert Lafore Techmedia
2. Publication.
3. The complete reference C – by Herbert shieldt Tata McGraw Hill
4. Publication.
5. Object Oriented programming with C++ , E Balagurusamy , Third Edition , Tata McGraw Hill.
6. Pure C++ programming , Amir Afzal, Pearson Education.
7. Java Programming Language By *Ken Arnold, James Gosling, David Holmes*
8. Head First Java By *Kathy Sierra, Bert Bates*

MSC IT 205 Soft Core Paper: Probability and Statistics

UNIT I:

Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem, Random variables – Discrete and continuous. Binomial, Poisson & normal distributions related properties. Sampling distributions –Sampling distribution of means (known and Unknown)

UNIT II:

Probability distributions- Binomial, Poisson, geometric, uniform, exponential, normal, gamma, beta, Correlation - Regression - multiple and partial correlation and regression (only problems). Probability density function and properties of 1, t~ chi-square distributions. Large sample tests - test" for means, variances and proportions. Analysis of variance: One-Way and two-way classifications, completely randomized blocks, randomized block design and Latin square design (only problems).

UNIT-III:

Tests of hypothesis point estimations – interval estimations Bayesian estimation. Bayesian inference with known priors, probability intervals, Bayesian inference with unknown priors, Large samples, Null hypothesis – Alternate hypothesis type I, & type II errors – critical region confidential interval for mean testing of single variance.

UNIT-IV:

Coefficient of correlation – Regression Coefficient – The lines of regression – The rank correlation.Cluster, PCA, Factor analysis, Discriminate analysis, statistics for decision making-algorithms Statistical Modelling.

Reference Books:

1) P.Kandasamy and others Engineering .l\1athematics Vol II , S.Chand and Co., New Delhi, 1987.
2) N.K.Venkataraman, Numerical methods in science and Engineering, The National Publishing Co., Chennai, 1986.
3) C.F.Gerald, Applied Numerical Analysis, Addison Wesley 1970.
4) S. S. Sastry, Introductory methods of numerical analysis, Prentice Hall of India, 1975
5) "Introduction to Probability and Statistics" by J. S. Milton and J.C. Arnold.
6) "Miller and Freund's Probability and Statistics for Engineers" by R.A. Johnson and C.B. Gupta.

MSC IT 206 Soft Core: Multimedia Technologies

Unit-I:

Introduction to Multimedia, Hardware & Software Components of multimedia, Multimedia Authoring and tools. Multimedia Communication Systems, Database Systems , Synchronization issues, Presentation requirements, Applications, Video conferencing, Virtual reality, Interactive Video– Media on Demand. Multimedia applications, evolving systems of multimedia-HDTV, UDTV Digital signal processing.

Unit-II:

Instructional Design, Objectives - Content (print, graphics, sounds, etc.), Interaction , Assessment, Closure, Internet Resources, Graphics, Integrating Web documents, Graphics Devices: Monitor display configuration, Basics of Graphics Accelerator Card and its importance, Basic concepts of Images: Digital Images and Digital Image Representation Image Formats :TIFF, BMP, JPG/JPEG, GIF, PIC. PDF, PSD: Theory of design, form, line, space,

texture, color, typography, layout, color harmony, unity, balance, proportion, rhythm, repetition, variety, economy, still life, light and shade, Poster Design.

Unit-III:

Multimedia elements – text, sound, Images Animation and video Digitalization of audio and video, Different algorithms to text audio, video and images. Input and Output Transducers-Human Vision and Audio Systems and their Limitations - Sampling, Quantization, Coding, Companding.

Unit-IV:

Multimedia file formats, standards, communication protocols, conversions, Data compression and decompression. Types and methods of compression and decompression. Architecture of Internet Multimedia Communication- Protocol Stack-Requirements and Design challenges of multimedia communications- Multimedia distribution models-Unicasting, Broadcasting and Multicasting.

Reference books:

1. V.S. Subrahmanian," Principles of Multimedia Database Systems", Morgan Kauffman, 2nd
2. Edition,2013.Tay V Vaughan "Multimedia: making it work", TMH.
3. K. R. Rao, Zoran S. Bojkovic, Dragorad A. Milovanovic, "Introduction to Multimedia
4. Communications Applications, Middleware, Networking", John Wiley and Sons, 2006.
5. Jean Warland, Pravin Vareya, "High Performance Networks", Morgan Kauffman
6. Publishers, 2002.
7. William Stallings, "High Speed Networks and Internets Performance and Quality of
8. Service", 2nd Edition, Pearson Education, 2002.
9. Aura Ganz, Zvi Ganz, Kitti Wongthawaravat, 'Multimedia Wireless Networks
10. Technologies, Standards and QoS', Prentice Hall, 2003.
11. Mahbub Hassan and Raj Jain, "High Performance TCP/IP Networking", Pearson Education, 2004

MSC IT 207 Soft Core: Enterprise Resource Planning

UNIT1

Introduction – Related Technologies – Business Intelligence – E-Commerce and EBusiness– Business Process Reengineering, E-Commerce and EBusiness, Implementation Challenges – Strategies – Life Cycle – Pre-implementation Tasks – Requirements Definition-Methodologies – Package selection – Project Teams –Process Definitions – Vendors and Consultants – Data Migration – Project management– Post Implementation Activities. Role of ERP in Purchasing, Purchase Module: Features of purchase module; Benefits of purchase module, ERP Purchase System.

UNIT II

Finance, Sales and Distribution, Manufacturing and Production Planning- Material and Capacity Planning; Shop Floor Control; Quality Management; JIT/Repetitive Manufacturing; Cost Management ; Engineering Data Management; Engineering Change Control, Configuration Management, Role of ERP in Finance, Accounting and Finance Processes: Cash management; Capital budgeting, Features of ERP Financial Module, Benefits of ERP Financial Module.

UNIT III

ERP IN ACTION & BUSINESS MODULES: Operation and Maintenance – Performance – Maximizing the ERP. Quality Management - Functions of Quality Management; CAQ and CIQ; Materials Management- Pre-purchasing; Purchasing; Vendor Evaluation; Inventory Management and Invoice Verification and Material Inspection.

UNIT IV

ERP MARKET: Marketplace – Dynamics – SAP AG – Oracle – PeopleSoft – JD Edwards – QAD Inc , SSA Global – Lawson Software – Epicor – Intutive. New Trends in ERP, ERP to ERP II- Implementation of Organisation-Wide ERP, Development of New Markets and Channels, Latest ERP Implementation Methodologies, ERP and E-business, Market Snapshot, The SOA Factor.

REFERENCES:

1. Alexis Leon, "ERP DEMYSTIFIED", Tata McGraw Hill, Second Edition, 2008.
2. Mary Sumner, "Enterprise Resource Planning", Pearson Education, 2007.
3. ENTERPRISE RESOURCE PLANNING: CONCEPTS AND PRACTICE VINOD KUMAR GARG, N. K. VENKITAKRISHNAN.
4. Jose Antonio Fernandz, " The SAP R /3 Handbook", Tata McGraw Hill, 1998.
5. Biao Fu, "SAP BW: A Step-by-Step Guide", First Edition, Pearson Education, 2003.

Open elective: Web Designing

UNIT-1

Introduction, Brief History of Internet, Web Standards. Introduction to HTML, HTML Document, Basic structure of an HTML document, Creating an HTML document, Mark up Tags, Heading-Paragraphs, Line Breaks, HTML Tags. Internet Principles – Basic Web Concepts – Client/Server model – Retrieving data from Internet – Scripting Languages – Perl Programming – Next Generation Internet – Protocols and applications. Tables & Lists – Creating Tables and Lists in HTML documents.

UNIT- 2

Creation of animated GIF, Sizing the pictures, Adding external images, video, and sound file including device independent (DVI) files. Add marquees of scrolling text. Frames Setting, releasing frames. Using one frame to index another. Creating floating frames, borderless frames and frames with borders. Links: Creating links to local range, other pages, specific part of page, electronic mail. Forms in HTML, Adding text box, check box, radio buttons, pulldown menus, single-line text field and password field, Processing the forms.

UNIT-3

Creating style sheets to other HTML element, altering different characteristics and features. Fundamentals of Web, Internet, WWW, Web Browsers and Web Servers, URLs, MIME, HTTP, Security, The Web Programmers Toolbox., CSS: Lists, Tables, Forms, Frames CSS: Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, the box model, Background images.

UNIT-4

XML: Introduction, Syntax, Document structure, Document type definitions, Namespaces, XML schemas, displaying raw XML documents, XML processors, Web services. PHP: Origins and uses of PHP, Overview of PHP, General syntactic characteristics, Primitives, operations and expressions, Output, Control statements, Arrays, Functions, Pattern matching, Form handling, Files, Cookies, Session tracking.

REFERENCE

1. HTML PROGRAMMERS REFERENCE ,by THOMAS A POWELL / DAN WHITWORTH
2. HTML 4 FOR DUMMIES, by ED TITTEL / MARY BURMEISTER
3. HTML & JAVA SCRIPT PROGRAMMING CONCEPTS, by SHANE TURNER E / KARL BARKSDALE
4. HTML INTRODUCTION TO WEB PAGE DESIGN & DEVELOPMENTSCHAUM OUTLINE SERIES , by DAVID MERCER
5. HTML & XML AN INTRODUCTION, by NIIT
6. HTML & JavaScript for Visual Learners , Chris Charuhas , ISBN : 81-7008-359-1 , Edition : 2008
7. Magic with HTML, DHTML & JavaScript, Dr. Ravinder Singh Amit Gupta ,ISBN : 978-81-318-0765-1 ,Edition : First, 2009
8. HTML, XHTML, CSS and XML by Example A Practical Guide , Teodoru Gugoiu ,ISBN : 81-7008-804-6, Edition : 2007 .
9. Internet and its Applications with HTML & VB-Script ,Prof. Shashi Banzal ISBN : 978-81-908565-6-0 ,Edition : First, 2009 .
10. Multimedia Applications and Web Designing ,Dinesh Maidasani ISBN : 978-81-318-0440-7 ,Edition : First, 2008

III Semester

MSC IT 301 Hard Core: Web Technologies

Unit-I:

Fundamental of Web ,History of Web, Web development overview, Domain Name System (DNS), DHCP and SMTP and other servers ,Internet service provider (ISP), Concept of IP Address, Internet Protocol, TCP/IP Architecture and protocol (IP) ,Web Browser and Web Server. Web Server, Web Client/Browser. Hyper Text Markup Language, Lists: Types of Lists Ordered Lists Adding Graphics to HTML Documents .Using the Border attribute; the Width and Height Attribute; Using the Align Attribute; Using the ALT Attribute.

Unit-II:

HTML Tag, Rules of HTML, Text Formatting & Style, List, Adding Graphics to Html Document, Tables and Layout , Linking Documents, Frame, Forms, Introduction to DHTML, CSS, Class & DIV, External Style Sheet. Tables: Introduction (Header, Data rows, The Caption Tag); Using the Width and Border Attribute; Using the Cell padding Attribute; Using the Cellspacing Attribute; Using the bgcolor Attribute; Using the COLSPAN and ROWSPAN Attributes. Image Mapping, Frames, Forms.

Unit-III:

Java Script in Web Page, Advantage of Java Script, JS object model and hierarchy, Handling event ,Operators and syntax of JS, Function, Client side JS Vs Server side JS ,JS security Introduction to VB Script, Operator & Syntax of VB Script, Dialog Boxes, Control & Loop, Function in VBS.

Unit-IV:

Introduction to XML, XML in Action, Commercial Benefits of XML, Gaining Competitive advantage with XML, Programming in XML, XML Schema, Browser Objects (The Web Page H'I'Ml, Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated); Handling (WEB PAGE) Events Using JavaScript (Named JavaScript Event handlers). Cookies: What are Cookies; Setting a Cookie.

Reference Books:

1. Hands On Html, Robertson Greg, Bpb Publications, .1999, New Delhi.
2. Mastering HTML 4 Premium Edition, Ray Deborah.S, & Ray Eric.J. Bpb Publications, 1999, New Delhi.
3. The Complete Reference Web Design, Powell Thomas.A., Tata McGraw-Hill Publishing Company Limited, 2000, New Delhi.
4. Professional Web Design - Theory and Technique On The Cutting Edge, Holzschlag

Molly,E., Galgotia Publications Pvt. Ltd, 1997, New Delhi.
5. Designing Interactive Websites, Mohler James.L, & Duff Jon.M, Thomson Learning, 1999, Africa.
6. Web Designing & Dreamweaver, Jauine Warner, Idg Books India (P) Ltd., 0, New Delhi.
7. XML By Example, Sean Mc Grath Pentice Hall Publication
8. "Introduction to XML" IDG Publication
9. Apache Tomcat Bible, Eaves Jon, Jones Rupert &. Godfrey Warner, Wiley Publishing Inc, 2003, New Delhi.

MSC IT 302 Hard Core: SOFTWARE ENGINEERING AND TESTING

Unit-I:

Software processes, desired characteristics of software process, the software life cycle, software development process models, comparison of process models. Software processes, desired characteristics of software process, the software life cycle, software development process models, comparison of process models. Requirement analysis and specification, need for SRS, characteristics of SRS, organization of SRS document.

Unit-II:

Structured coding Techniques, Coding Styles-Standards and Guidelines, Documentation Guidelines, Modern Programming Language Features: Type checking-User defined data types, Data Abstraction, Exception Handling and Concurrency Mechanism. Requirements Engineering: Establishing the Groundwork-Eliciting Requirements- Developing use cases-Building the requirements model-Negotiating, validating Requirements-Requirements Analysis-Requirements Modeling Strategies.

Unit-III:

TESTING - Software Quality- Software Quality Dilemma- Achieving Software Quality- Testing: Strategic Approach to software Testing- Strategic Issues- Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging.

Unit-IV:

Maintenance - Software Maintenance-Software Supportability- Reengineering- Business Process Reengineering- Software Reengineering- Reverse Engineering-Restructuring-Forward Engineering- Economics of Reengineering.

Reference books:

1. "Fundamentals of Software Engineering" by Rajib Mall
2. Software Testing, Rajani Renu & Oak Pradeep, Tala IvIcGraw-Hill Publishing Company Limited, 2004, New Delhi
3. "Software Engineering: A practitioner's approach" by Roger S. Pressman

4. Software Engineering, Sommerville Ian, Pearson Education Asia, 2004, New Delhi
5. Software Project Management - Inclination, Mike Cotterell, Bob Hughes, "Thomas Computer Press, 1995.
6. “Software Engineering” by Ian Sommerville
7. Software Engineering by K.K. Aggarwal & Yogesh Singh, New Age International Publishers

MSC IT 303 Hard Core: Mobile Computing and Application

UNIT – I

Introduction: Current Wireless Systems: Overview of Paging Systems, Cordless Phones, Cellular Telephone Systems, Satellite Communication, Wireless LANs, Blue tooth. Medium access control, Telecommunication Systems – SDMA, TDMA, CDMA, GSM

UNIT - II

Mobile computing through Internet- Mobile-enabled Applications , Mobile Applications – Multichannel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture , GPRS – Mobile Computing through Telephony - Synchronization protocol .

UNIT - III

Wireless LAN – IEEE 802.11 – Infrared vs Radio Transmission, Infrastructure Networks, Ad-hoc Networks, Bluetooth Wireless ATM, Radio Access Layer, Handover, Location Management, Addressing Mobile Quality of Service, Access Point, Control Protocol.Mobile Communication: Wireless Transmission – Medium Access Control – Telecommunication Systems – Satellite Systems – Broadcast system – Wireless LAN .

UNIT - IV

MAC protocol – Routing protocols - Transport Layer Protocol - QOS – Energy Management. Overview of Cellular IP – Options of Cellular IP – Key, Mechanism in Cellular IP – route Optimization. Overview of TCP/IP – Structure of TCP/IP. Advert-Hoc Primary Ideas – Traits Purposes.

Text Books

1. J Schiller ,’Mobile Communication’ , Addison Wesley, 2000
2. John Wiley,’ Mobile Communication Design Fundamentals’, 1993.
3. Wireless Communication and Networks, Pearson Education, 2003.
4. WAP-Wireless Application Protocol, Pearson Education, 20034. Jochen Burkhardt
5. Dr.Horst Henn, Klaus Rintdoff,Thomas Schack, “Pervasive Computing”, Pearson, 2009.
6. Fei Hu , Xiaojun Cao, “ Wireless Sensor Networks Principles and Practice “ CRC Press, 2010.

MSC IT 304 Hard Core: Advanced JAVA

Unit-I

Exception and Multithreads: Exception-type, Uncaught Exception, Using trycatch, throw, throws, finally, Throwable class and object, Exception classes, Create own exception subclass. Creating multiple threads, isAlive(), join(), Thread priorities, synchronization, -Deadlock, wait(), notify(), notify All() methods, Inter-Thread Communication, suspend, resume & stop the threads. Swing: Event Handling, JFrames, Lists , Tables, Trees, Text Components, Progress Indicators, Component Organizers.

UNIT – II

Enterprise Java Bean: Preparing a Class to be a JavaBean, Creating a JavaBean, JavaBean Properties, Types of beans, Stateful Session bean, Stateless Session bean, Entity bean, Servlet API and Lifecycle, Working with servlets: organization of a web application, creating a web application (using netbeans) , creating a servlet, compiling and building the web application.

Unit-II

JDBC: Design of JDBC, JDBC configuration, Executing SQL statement, Query Execution, Scrollable and updatable result sets, row sets, metadata, Transaction. **JSP:** Introduction, disadvantages, JSP v/s Servlets, Lifecycle of JSP, Comments, JSP documents, JSP elements, Action elements, implicit objects, scope, character quoting conventions, unified expression language.

Unit-III

Java server Faces : Need of MVC , what is JSF?, components of JSF, JSF as an application, JSF lifecycle, JSF configuration, JSF web applications (login form, JSF pages) **EJB:** Enterprise bean architecture, Benefits of enterprise bean, types of beans, Accessing beans , packaging beans, creating web applications, creating enterprise bean, creating web client, creating JSP file, building and running web application.

Unit-IV

HIBERNATE: Introduction, Writing the application, application development approach, creating database and tables in MySQL, creating a web application, Adding the required library files, creating a java bean class, creating hibernate configuration and mapping file, adding a mapping resource, creating JSPs. WEB Services: SOAP, Building a web services using JAX-WS, Building web service. JAVAMAIL: Mail Protocols, Components of the Javamail API, JAVAMAIL API, Starting with API.

Books:

1) Java EE 6 for Beginners, Sharanam Shah, Vaishali Shah, SPD (Unit II to VI)
2) Core Java Vol. II – Advanced Features, Cay S. Horstmans, Gary Coronell, Eight Edition, Pearson (Unit I and III)
3) Java Complete Reference, Herbert Schildt, Seventh Edition,TMH. (Unit I)
4) Java EE Project using EJB 3, JPA and struts 2 for beginners, Shah, SPD
5) Java Programming A practical Approach, C Xavier, McGraw Hill
6) Java Server Faces A practical Approach for beginners, B M Harwani, Eastern Economy
7) Edition (PHI).
8) Advanced Java Technology, Savaliya, Dreamtech.

MSC IT 305 Soft Core : DATA WAREHOUSING AND DATAMINING

UNIT-1

Introduction: Need for data warehousing: Data warehousing Components –Building a Data warehouse –- Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools – Metadata. Dimensional analysis, Multidimensional analysis.

UNIT-II

Principles of dimensional modelling: Objectives, From Requirements to data design, the STAR schema, STAR Scheme Keys, Advantages of the STAR Scheme, Dimensional Modelling: Updates to the Dimension tables, miscellaneous, the snowflake scheme, aggregate fact tables, and families of STARS.

UNIT-III

OLAP in the Data Warehouse: Demand for online analytical processing, OLAP: definitions and rules, OLAP characteristics, major features and functions, general features, dimensional analysis, Hyper cubes, Drill-down and roll-up, slice-and-dice or rotation, OLAP models, overview of variations, the MOLAP model, the ROLAP model, ROLAP versus MOLAP.

UNIT-IV

Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing. The knowledge discovery process, OLAP versus data mining, data mining and the data warehouse, Major Data Mining Techniques, Cluster detection, decision trees, neutral networks, genetic algorithms, Benefits of data mining, applications in retail industry.

Reference Books:

1) Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
2) K.P. Soman, Shyam Diwakar and V. Aja, "Insight into Data Mining Theory and Practice", Eastern Economy Edition, Prentice Hall of India, 2006.
3) G. K. Gupta, "Introduction to Data Mining with Case Studies", Eastern Economy Edition, Prentice Hall of India, 2006.
4) Daniel T.Larose, "Data Mining Methods and Models", Wiley-Interscience, 2006. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P. Ltd.,
5) A Guide to Data Warehousing – Hochit
6) Data Warehousing in Real World – anahory
7) Data Mining – Addsiaans (Addison Wesley)

MSC IT 306 Soft Core: Software Project Management.

Unit-I

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning. Evolution of Software Economics : Software Economics, pragmatic software cost estimation. Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality.

Unit-II

Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control.

Unit-III

Work Flows of the process: Software process workflows, Iteration workflows, Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, costand schedule estimating.

Unit-IV

Project Organizations, evolution of Organizations. Process Automation: Automation Building blocks, The Project Environment. Understanding Behaviour, Organizational Behaviour, A Background – Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation, The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies. Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

Reference Books:

1. Software Project Management, Walker Royce: Pearson Education, 2005.
2. Information Technology Project management (4th Edition) – Kathy Schwalbe (Centgage Learning – Indian Edition)
3. Project Management Core Textbook – Mantel Jr., Meredith, Shafer, Sutton with Gopalan (Wiley India Edition)
4. Information Technology project Management,: a concise study, (3rd ed.) by S A Kelkar (PHI)
5. Project Management- A systems Approach to planning, scheduling and controlling - Harold Kerzner (John Wiley & Sons, Inc)
6. *A Guide to the Project Management Body of Knowledge (3rd Edition)*- Newtown Square, PA, Project Management Institute, 2005.

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MSC IT 307 Soft Core: Cyber Laws & Network Security

Unit-I

Cyber Law: Basic Concepts of Technology and Law : Scope of Cyber Laws, Cyber Jurisprudence. Law of Digital Contracts : The Essence of Digital Contracts, The System of Digital Signatures, The Role and Function of Certifying Authorities, Information Technology Act 2000 : Information Technology Act-2000-1 (Sec 1 to 13), Information Technology Act-2000-2 (Sec 14 to 42 and Certifying authority Rules), Information Technology Act-2000-3 (Sec 43 to 45 and Sec 65 to 78), Information Technology Act-2000-4(Sec 46 to Sec 64 and CRAT Rules), Information Technology Act-2000-5 (Sec 79 to 90), Information Technology Act- 2000-6 (Sec 91-94) Amendments in 2008.

UNIT - II

Conventional Encryption : Classical Technique – Modern technique – Algorithms; Public Key Cryptography : Public Key Cryptography – Introduction to Number Theory – Message Authentication and Hash Function – HASH and MAC Algorithm – Digital Signature and Authentication protocol.

UNIT – III

Network Security Practice: Authentication Application – Electronic Mail Security – IP Security Program Security and System Security: Secure programs – Nonmalicious program errors – viruses and Worms – Memory and address protection – control access to general objects – File protection mechanism – user authentication – Trusted operating system design and assurance – Intrusion Detection system.

UNIT – IV

System Security and Web Security: Intruders,– Firewall - Managing Access – Password management - Web Security requirements – SSL and TLS – SET; Client Side Security : Using

SSL – Active Content – Web Privacy. Database Security**:** The Database as a Networked Server, Securing database-to-database communication, Reliability and Integrity of database, sensitive data – inference – multilevel databases

UNIT - V

Wireless Network Security: Mobile Security – Encryption Schemes in WLANs – Basic approach to WLAN security and Policy Development – WLAN intrusion process – WLAN security solutions. Digital Watermarking and Steganography: Models of Watermarking – Basic Message Coding – Watermark Security – Content Authentication – Steganography.

TEXT BOOKS:

1. Information Security and cyber laws, Saurabh Sharma, student series, Vikas publication.
2. Charrles P. Pfleeger, Shari Lawrence Pfleegner, "Security in Computing", Prentice Hall of India, 2007.
3. William Stallings, "Cryptography and Network Security", 5th Edition, Pearson.
4. John W.Rittinghouse, James F.Ransome, "Wireless Operaional Security", Elsevier, 2004.
5. Ron Ben Natan,"Implementing Database Security and Auditing", Elsevier, 2005.
6. Lincoln D. Stein, "Web Security", Addison Wesley, 1999.
7. Ingemar J.Cox, Matthew L. Miller Jeffrey A.Bloom, Jessica Fridrich,Ton Kalker,"Digital Watermarking and Steganography", 2nd Edition, Elsevier.
8. Dr.R.K.Tiwari, P.K.Sastri, K.V.Ravikumar, " Computer Crime and Computer Forensics", 1st Edition, Selective Publishers, 2002.

Fourth Semester

MSC IT 401 Hard Core: Cloud Computing

UNIT - I

Cloud Computing definition, private, public and hybrid cloud. Cloud types: IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery, next generation Cloud Applications.

UNIT - II

Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services. Economics of choosing a Cloud platform for an organization, based on application

UNIT - III

Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages.

UNIT-IV

Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service.

Reference Books

1. Anthony T.Velte, Toby J.Velte, Robert Elsenpeter, "Cloud Computing –A Practical Approach", Tata McGraw Hill Education Pvt. Ltd, 2010.
2. Michael Miller," Cloud Computing: Web based Applications that change the way you work and Collaborate online", Que Publishing, August 2008.
3. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for on demand computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pvt. Ltd, July 2008.
4. Prof (Dr.) Andreas Polze, "A Comparative Analysis of Cloud Computing Environments".
5. Cloud Economics.

Elective papers (Select any one Paper)

MSC IT 402 Soft Core: Programming with C #

UNIT-I

Introduction to C # : Evaluation of C#, characteristics of C#, application of C#, difference between C++ and C#, difference between Java and C#. Introduction to C# environment : The origins of the .NET technology, the .NET framework, the common language runtime, framework base classes, user and programs interface, visual studio .NET, .NET languages, benefits of the .NET approach, C# and .NET.

UNIT-II

Overview of C#: Programming structure of C#, editing, compiling and executing C# programs, namespace, comments, using aliases for namespace classes, using command line argument, maths function. Literals, variables and data types : literals, variables, data types, value types, reference type, declaration of variables, initialization of variables, default values, constant variables, scope of variables, boxing and unboxing.

UNIT III

Operators and expression : arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, Bitwise operators, special operators, arthmetic expressions, evaluation of expression.

UNIT IV

Decision making and branching: if statement, ifelse statement, nesting of ifelse statement, the elseif ladder, switch statement. Decision making and looping: while statement, do statement, for statement, for each statement, jumps in loops. Methods in C# : declaring methods, the main method, invoking methods, nesting of methods, methods parameters, pass by value, pass by reference, the output parameters, variable arguments list, method overloading.

MSC IT 403 Soft Core: Software Communication & Documentation

UNIT-1

The Seven Cs of Effective Communication, Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness Communication: Its interpretation**,** Basics, Nonverbal Communication, Barriers to Communication

UNIT-II

Business Communication at Work Place: Letter Components and Layout, Planning a letter, Process of Letter, writing, E-mail Communication, Memo and Memo reports, Employment Communication, Notice agenda and Minutes of meeting, Brochures

UNIT-III

Report Writing, Effective writing, types of business reports, structure of reports, gathering information, organization of the material, writing abstracts, and summaries, writing definitions, visual aids, user instruction manual.

UNIT-IV

Required Skills: Reading skills, listening skills, note-making, précis writing, audiovisual aids, oral communication, Mechanics of Writing**,** Transitions, Spelling rules, hyphenation, transcribing numbers, Abbreviating technical and non-technical terms, Proof reading.

Books:

1. Professional Communication by Aruna Koneru, McGrawHill
2. Effective Business Communication by Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas, McGrawHill

References:

1. Business Communication, Lesikar and Petit, McGrawHill
2. Communication Skills Handbook, Summers, Wiley, India
3. Business Communication (Revised Edition), Rai and Rai, Himalaya Publishing House
4. Business Correspondence and Report Writing by R. C. Sharma and Krishna Mohan, TMH.

MSC IT 404 Soft Core: Geographic Information Systems

Unit I

Spatial Data Concepts: Introduction to GIS, Geographically referenced data, Geographic, projected and planer coordinate system, Map projections, Plane coordinate systems, Vector data model, Raster data model

Unit II

Data Input and Geometric transformation: Existing GIS data, Metadata, Conversion of existing data, Creating new data, Geometric transformation, RMS error and its interpretation, Resampling of pixel values.

Unit III

Attribute data input and data display : Attribute data in GIS, Relational model, Data entry, Manipulation of fields and attribute data, cartographic symbolization, types of maps, typography, map design, map production Data exploration: Exploration, attribute data query, spatial data query, raster data query, geographic visualization

Unit IV

Vector data analysis: Introduction, buffering, map overlay, Distance measurement and map manipulation. **Raster data analysis:** Data analysis environment, local operations, neighbourhood operations, zonal operations, Distance measure operations Spatial **Interpolation:** Elements, Global methods, local methods, Kriging, Comparisons of different methods

Text Book

1. Introduction to Geographic Information Systems by Kang-Tsung Chang Published by Tata Mcgraw Hill

Reference Books and websites

1. Concepts and Techniques in Geographic Information Systems by Chor Pang Lo and Albert K. W. Yeung
2. http://www.ncgia.ucsb.edu/giscc/

Project

The project should be undertaken preferably individually or by the group of maximum 3 students who will jointly work and implement the project. The candidate/group will select a project with the approval of the Guide (staff member) and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages within one month of the starting of the semester. The candidate/ group is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work during the semester IV as a part of

the term work submission in the form of a joint report. Candidate/group will submit the completed project work to the department at the end of semester IV as mentioned below.

1) The workable project.

2) The project report in the bound journal complete in all respect with the following : -

a) Problem specifications.
b) System definition – requirement analysis.
c) System design – dataflow diagrams, database design
d) System implementation – algorithm, code documentation
e) Test results and test report.
f) In case of object oriented approach – appropriate process be followed.

The project report should contain a full and coherent account of your work. Although there will be an opportunity to present the work verbally, and demonstrate the software, the major part of the assessment will be based on the written material in the project report. One can expect help and feedback from the project guide, but ultimately it's the candidates own responsibility. The suggestive structure of a project report should be guided by your guide in selecting the most appropriate format for your project. The term work assessment will be done jointly by teachers appointed by Head of the Institution. The oral examination will be conducted by an internal and external examiner as appointed by the University.

Note:

1) Project work should be continually evaluated based on the contributions of the candidate/group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
2) Two mid-term evaluations should be done, which includes presentations and demos of the work done.

Open elective--Multimedia Applications

Unit-I

Introduction**,** scope of multimedia. Applications of multimedia, hardware and software requirements, Digital representation**:** Introduction, Analog representation, waves, digital representation, need for digital representation, A to D conversion, D to A conversion, relation between sampling rate and bit depth, Quantization error, Fourier representation, pulse modulation. Importance and drawback of digital representation.

Unit-II

Text and Image: Introduction, Types of text, Font, insertion, compression, File formats. Types of images, colour models, Basic steps for image processing, principle and working of scanner and digital camera, Gamma and gamma correction.

Unit-III

Audio and Video technology: Fundamental characteristics of sound, psycho- acoustics, Raster scanning principles, sensors for TV cameras, color fundamentals, additive and subtractive color mixing, Liquid crystal display (LCD), Plasma Display Panel (PDP), file formats.

Unit-IV

Compression and coding: What is compression? Need for compression, Types of compression, basic compression techniques-run length, Huffman's coding, JPEG, zip coding. Overview of Image and Video compression techniques.

Reference Books:

1. Multimedia Systems Design by Prabhat K. Andleigh and Kiran Thakrar-PHI publication
2. Multimedia systems by John F. Koegal Buford-Pearson Education.
3. Principles of Multimedia by Ranjan Parekh. Tata McGraw-Hill
4. Fundamentals of multimedia by Ze-Nian Li and MS Drew. PHI EEE edition.

Term Work:

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