MAHARSHI DAYANAND SARASWATI UNIVERSITY, AJMER

पाठ्यक्रम
SYLLABUS

SCHEME OF EXAMINATION AND COURSES OF STUDY

FACULTY OF SCIENCE

M.Sc.Computer Science
Annual Scheme (For Affiliated College)
M.Sc. C.S. (Prev.) & (Final)

२०१२−१३ से प्रभावी(w.e.f.)

सत्र २०१३−१४

महर्षि दयानन्द सरस्वती विश्वविद्यालय, अजमेर

NOTICE

1. Change in Statutes/Ordinances/Rules/Regulations/ Syllabus and Books may, from time to time, be made by amendment or remaking, and a candidate shall, except in so far as the University determines otherwise comply with any change that applies to years he has not completed at the time of change. **The decision taken by the Academic Council shall be final.**

सूचना

1. समय-समय पर संशोधन या पुन: निर्माण कर परिनियमों / अध्यादेशों / नियमों / विनियमों / पाठ्यक्रमों व पुस्तकों में परिवर्तन किया जा सकता है, तथा किसी भी परिवर्तन को छात्र को मानना होगा बशर्ते कि विश्वविद्यालय ने अन्यथा प्रकार से उनको छूट न दी हो और छात्र ने उस परिवर्तन के पूर्व वर्ष पाठ्यक्रम को पूरा न किया हो। **विद्या परिषद** द्वारा लिये गये निर्णय अन्तिम होंगे।

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TEACHING AND EXAMINATION SCHEME FOR M. SC. COMPUTER SCIENCE (PREVIOUS)

Paper Name (Theory)	Lec	Tut	Exam Hours	Max Marks Internal	Max Marks Main
MSC – 101 Computer Architecture	3	1	3	20	80
MSC – 102 Programming with C	3	1	3	20	80
MSC – 103 Electronic Data Processing	3	1	3	20	80
MSC – 104 Computer Communications & Networks	3	1	3	20	80
MSC – 105 Programming in Visual Basic.Net	3	1	3	20	80
MSC – 106 Operating Systems	3	1	3	20	80
MSC – 107 Computer Graphics	3	1	3	20	80
MSC – 108 Compiler	3	1	3	20	80
Total of Theory					**800**

Paper Name (Practical)	Pract Hours	Pract Exam	Min Mark	Max Marks
MSC – 109 Computer Architecture (Problem solving with hardware kit)	3	3	20	50
MSC – 110 C & FoxPro	3	3	20	50
MSC – 111 Visual Basic.Net, Computer Graphics	3	3	20	50
MSC – 112 Linux, Shell Programming	3	3	20	50
Total of Practical				**200**
Grand Total (Theory + Practical)				**1000**

M. SC. COMPUTER SCIENCE (FINAL)

Paper Name (Theory)	Lec	Tut	Exam Hours	Max Marks Internal	Max Marks Main
MSC – 201 OOPS with C++ and Data Structures	3	1	3	20	80
MSC – 202 Advance Database Management Systems	3	1	3	20	80
MSC – 203 Software Engineering	3	1	3	20	80
MSC – 204 Data Warehouse	3	1	3	20	80

MSC – 205 Image Processing	3	1	3	20	80
MSC – 206 Artificial Intelligence	3	1	3	20	80
MSC – 207 XML Technology	3	1	3	20	80
Optional:					
MSC – 208a Web Technology	3	1	3	20	80
MSC – 208b Spatial Database Management Systems					
Total of Theory					800

Paper Name (Practical)	Pract Hours	Pract Exam	Min Mark	Max Marks
MSC – 209 C++, Software Engineering	3	3	20	50
MSC – 210 Data Warehousing, Oracle	3	3	20	50
MSC – 211 XML Programming	3	3	20	50
MSC – 212 Projects	6	3	40	100
Optional:				
MSC – 213a Java, Javascript, FrontPage, Internet	3	3	20	50
MSC – 213b ArcView/ArcGIS/GeoMedia				
Total of Practical				300
Grand Total (Theory + Practical)				1100

The question paper will be divided into 3 parts:

Part A:
1. 10 Question of 1 mark each
2. Answer should not exceed more than 20 words
3. All questions are compulsory

Part B:
1. 5 Questions of 2 marks each
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:
1. 3 Questions of 20 marks each. There will be an internal choice in each question.
2. Answer should not exceed 400 words
3. All questions are compulsory.

Note:
1. Lec: Lectures Tut: Tutorials per week per hour
2. There will be sessional (internal assessment) of 20 marks conducted by the college
3. Two Practical exams shall be conducted by one internal and one external examiner of a batch of 20 students in day.
4. **Project Work:** 6 hours per student.
   The Project Report work shall be assessed by one internal and one external examiner only of a batch of 20 students in a day. The project work should not be done in a group. Each student shall be allotted one project and one copy should be submitted to the University.
5. Duration of Practical exam is 3 hours.
6. A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
7. Practical of 50 marks distribution is as under:
   a. 30 marks for practical examination exercise for 3 questions
   b. 10 marks for Viva-voce
   c. 10 marks for Laboratory Exercise File

Scheme of Examination

(For M. Sc. Computer Science/Information Technology)

Reg. 17 (a)

The examination for the M. Sc. Computer Science/Information Technology will consist of (a) Theory papers (b) Laboratory / Practical work and project work. Candidates will be required to pursue a regular, full time course of study at the University department and the affiliated colleges for a period of two academic years in order to be eligible for appearing in the examination.

1. Eligibility for M. Sc. Computer Science/Information Technology: 50% marks in any graduation scheme.
2. Examination:
   i. There shall be 25 papers (16 theory, 8 practical in each year and 1 project as practical in the final year) of 2100 marks (previous and final year). Theory paper shall be of 3 hours duration having 100 marks. Out of 100 marks 20 marks shall be considered as internal assessment based on internal test and seminars and 80 marks will be of examination determined by the University. The practical shall be of 50 marks assessed by external examiner and the project work shall be of 100 marks based on project presentation and viva-voce, assessed by external examiner.
   ii. For passing a candidate shall have to secure at least 40% marks in each course (theory paper, sessional and practical work separately) and 50% marks in the aggregate in all the courses.

iii. Due paper(s) will be applicable if a candidate obtains 50% marks in aggregate and fails in not more than three (3) papers (theory). Due paper(s) will be held along with the examination of the next year. The chance of due paper(s) will be given only 2 times.

iv. Wherever a candidate appears at for a due paper examination he/she will do so according to the syllabus in force.

v. A candidate not appearing at any examination/absent in any paper of term end examination shall be deemed as fail.

3. A candidate for a pass in the examination shall be required to obtain:

i. At least 50% marks in the aggregate of all the papers prescribed for the examination and

ii. At least 50% marks in the practical(s) wherever prescribed at the examination, provided that if a candidate fails to secure at least 40% marks in each individual paper at the examination notwithstanding his having obtained the minimum percentage of marks required in the aggregate for that examination.

No Division will be awarded in the Previous Year examinations. Division shall be awarded at the end of the Final Year Examination on the combined marks obtained at the previous and final examinations taken together as noted below:

Passed with First Division   60% of the aggregate marks taken together of previous and final examinations

Passed with second division   48%

Provided that if a candidate clears any paper after a continuous period of two years since he/she was admitted to the M. Sc. Computer Science/Information Technology then for the passing marks, i.e. 40% marks, shall be taken into account in the case of such course(s).

Provided further that in case where a candidate requires more than 40% marks in order to reach the requisite minimum aggregate as many marks, out of those actually secured by him/her will be taken into account as would enable him/her to make up the deficiency in the requisite minimum aggregate marks.

4. Candidates reappearing at an examination in a subsequent year shall be examined in accordance with the scheme and syllabi in force and shall be entitled to the award of the degree of year in which they clear the last failing/unclear paper.

Duration 3 hours   *Max Marks 80*

MCS – 101 COMPUTER ARCHITECTURE

Number system, Logic Gates, Boolean Algebra, K-Map, combinational circuit, flip-flop, sequential circuit, encoder, decoder, multiplexer, shift register, fixed-point representation, floating-point representation.

Register transfer language, inter-register transfer, arithmetic micro operation, logic and shift micro operation, instruction codes, timing and control, input/output and interrupts.

Processor bus organization, arithmetic logic unit, stack organization, instruction format, addressing mode, data transfer and manipulation, program control, control memory, addressing sequence, micro program sequencer, micro instruction formats.

Block diagram of 8085 and pin configuration, 8086/8088 instruction set, data transfer instructions, arithmetic, logical, shift, rotate, flag, compare, jump instruction, subroutine, loop, addressing modes, memory hierarchy, associative memory, memory addressing, virtual memory, cache memory, cache coherence.

Reference Books:

1. Computer Architecture and Organization, Hayes, Tata McGraw Hill
2. Computer Architecture and Logic Design, Thomas C, Tata McGraw Hill
3. Computer System Architecture, M. Morris Mano, PHI
4. Digital computer, M. Morris Mano, PHI
5. Computer Architecture, William Sterling

Duration 3 hours   *Max Marks 80*

MCS – 102 PROGRAMMING WITH C

C Language: Types, Operators and Expressions, variable names, data types and sizes, constants, declarations, operator, expressions and type conversions.

Control flow: Statements and blocks, selection and loops structures, break, continue, branching and labels.

Functions and program structure: Basics, functions and their arguments, external variables and static variables, scope rules, register variables, block structures, initialization, recursion.

Pointers and Arrays: Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, multi-dimensional arrays, pointers arrays, pointer to functions, 2D string and string functions.

Structures: Basics, structures and functions, arrays of structures, pointers to structures, table look up fields, typedef, file, stack, single linked list, double linked list, circular linked list, prefix, postfix, infix, queue, d-queue.

Duration 3 hours   *Max Marks 80*

MCS – 103 ELECTRONIC DATA PROCESSING

Concept of system, type of decision, information system, classification, conventional file system, object of database systems, data abstraction, data definition language, data manipulation language, database administrator. Database design stages, database model, database system architecture.

Centralized and client/server architecture in DBMS, entity relationship model, entities and entity sets their relationship, mapping constraints, generalization, aggregation, use of ER model for the design of databases, sequential, random, index sequential file organization, introduction and history of relational database, system relational algebra, normalization up to DKNF.

Introduction to FoxPro: creation of database, field types, adding records, editing and deleting of data, viewing data, navigating in data file, searching of data, memory variables and arrays.

Sorting the database, Indexing, compound index files, managing multiple data files, setting environment using SET commands, setting filters, setting relations, date & time functions, character and file functions.

Programming with FoxPro, input and output, making decisions, loop constructs, debugging programs, setting up screen displays, procedures and user-defined functions, creating and printing formatted reports

Reference Books:
1. Visual FoxPro, Programming Basics, Tom Stearns, Tata McGraw
2. Mastering Visual FoxPro 3, Siegel BPB Publications•
3. Database Management System, Korth, Tata McGraw Hill.
4. Data Base System Concept, C J. Date
5. Data Base Management system, Navathe, Pearson Education Asia

Duration 3 hours   *Max Marks 80*

MCS – 104 COMPUTER COMMUNICATIONS AND NETWORKS

Introduction to Data communications and networking, protocols, standards and architecture, topology, transmission mode, OSI model, analog and digital signals, periodic and aperiodic signals, time and frequency domain, Fourier analysis concept.

Encoding digital to digital conversion, analog to digital conversion, digital to analog conversion, analog to analog conversion, transmission of digital data, DTE-DCE interface, EIA-232, , X.21, modem, cable modem, guided and unguided, transmission media

Multiplexing, TDM, FDM, WDM, DSL, HDLC, error classification, types of errors, error detection, error correction, virtual redundancy check, longitudinal redundancy check, cyclic redundancy check.

Asynchronous transfer mode, protocol architecture, ATM cells, ATM layers, switches, circuit switching network and concepts, routing, packet switching, X.25, virtual circuit approach, point-to-point layers, link control protocol, network control protocol.

Reference:
1. Data and Computer communications, William Stallings, PHI
2. Data communication and networking, Behoruz A. Forouzan
3. Data communication and networking, A S Godbole, Tata McGrawhill
4. Network concepts and Architecture, Hancock, BPB Publications
5. Data Communication and Networking, Tannenbaum, PHI

Duration 3 hours   *Max Marks 80*

MCS – 105 PROGRAMMING IN VISUAL BASIC.NET

Introduction to Visual Basic .NET IDE and its features, .NET framework, CLR Language basics: data type, operators, control statements: branching and looping. NET Controls Forms, text boxes, labels, command button, radio button, option buttons, check boxes, list boxes and combo boxes, introduction to ActiveX controls

Strings and Arrays Working with Arrays, array resizing, System.Array class, manipulation of string, string functions for comparison, concatenation, copy, replace, substring, length

Working with Classes Classes, properties and methods, attaching a class with a form Inheritance: derived from existing classes, overriding methods from base class

Exception Handling Types of errors, structured and unstructured exceptions Tracing Errors: breakpoints, watch, quickWatch, autos, locals, call stack. Database Access ADO.NET and it's Components, datasets, data adapters, server explorer, binding controls to database

Books :
1) Visual Basic.NET Black Book – Steve Holzner
2) Visual Basic.NET Programming Bible – Bill Evjen
3) Pro ADO.NET with VB.NET – Sahil Mailk and Paul Dickinson

Duration 3 hours   *Max Marks 80*

MCS – 106 OPERATING SYSTEMS

Introduction to Operating Systems, goals of OS, operation of OS, resource allocater and related functions, classes of OS, batch processing, multiprocessing, time sharing, distributed, real time systems, system calls, system programs, structure of OS, layer design of DOS, Unix.

Process concept, interacting process, threads, process, process scheduling, fundamental of scheduling, scheduling criteria, long medium short term scheduling, scheduling algorithms , critical section, critical region, inter-pro-

cess communication, monitor and semaphores.

Logical versus physical address, swapping, contiguous allocation, segmentation, paging, segmentation with paging, kernel memory allocation, page replacement algorithm, virtual memory, virtual memory with paging, demand paging, dead lock, characterization, methods for handling dead locks, prevention, avoidance, thrashing, allocation of frame, virtual memory using segmentation

History of Linux, Linux architecture, Linux File System, file naming, types of files, directory command, file command, vi editor, locating files in Linux, filter, pipe, shell variables, local and global variables, command substitution, if, while, for, shift, tar, basic networking commands in Linux.

Reference:
1. Advance Unix – A Programmer's Guide, Prata, SAMS
2. Operating System Concepts, Galvin, Addison Wesley
3. Operating Systems, Ritchie, BPB Publications.
4. Unix System V Primer, Prata, BPB Publications

Duration 3 hours   *Max Marks 80*

MCS – 107 COMPUTER GRAPHICS

Interactive graphics, passive graphics, advantage of interactive graphics, classification of application, hardware and software requirement of computer graphics, point, line, DDA algorithm, Bresenham's line algorithm, circle, circle generating algorithm, midpoint circle algorithm, ellipse generating algorithm, midpoint ellipse algorithm, polynomial and spline curves, parallel curve algorithms, curve function, filled area primitives, line attributes, curve attributes, area fill attributes, clippings, clipping lines.

2D transformation, matrix representation of 2D, composite transformation, translation, rotation, scaling, general pivot-point rotation, general fix scaling, other transformations, reflection, shear, affine transformations and transformation functions, window-to-view port transformation, clipping operation, point, line, Cohen-Sutherland line clipping, polygon clipping.

3D display method, parallel projection, perspective projection, visible line identification, depth cueing, surface rendering, polygon surface, table, equation, mashes, splines, representation, cubic spline interpolation, Bezeir Curves and surfaces, B-spline and surfaces, Beta-spline, 3D transformation, rotation, scaling, composite transformation, 3D transformation function.

Reference:
1. Principles of Interactive Computer Graphics, Newman and Sproull, Tata McGraw Hill
2. Computer Graphics, Plastok and Gordon Kalley, McGraw Hill
3. Computer Graphics, Cornel Pokorny, BPB Publications.
4. Computer Graphics, Hern & Becker, Pearson Publication (LPE)

Duration 3 hours   *Max Marks 80*

MCS – 108 COMPILERS

Introduction to compiler, stages, phases, passes, grammar, regular and context-free languages, structure of compiler role of the lexical analyzer, design of lexical analyzers, regular expressions, parse tree.

Parsers, top-down parsing, LL(1) grammar, recursive descent, bottom-up parsing, shift reduce, operators, pre-cascade, LR parser, parse table, constructing SLR parsing table.

Intermediate code, parse tree, syntax tree, tree address code, quadruples, and triples, translation of assignment statements, symbol table

Reference:
1. Principles of Compiler design, Alfred V Aho & Jeffrey D Ullman, Addison Wesley.
2. System programming, Donovan
3. The Essence of Compilers, Robin Hunter, Pearson Education (LPE)

Duration 3 hours   *Max Marks 80*

MCS – 201 OOPS WITH C++ AND DATA STRUCTURES

Data types, operator, input-output, control statements, loops, arrays, strings and string functions, functions, structure and union, Introduction to OOPS, object oriented analysis and design, class, declaring object, member function, data hiding, parameter passing, friend function and class, empty static, overloading, constructor, type of constructor, destructor, recursive constructor, overloading unary operator, binary operator with friend function, rule of overloading.

Inheritance, derive and base class, overriding, base and derive constructor, type of inheritance, virtual base class, abstract class, qualifier class and inheritance, pointer, pointer to class, pointer to object, pointer to derived class and base class, pointer to member, pointer to array, accessing private member and direct access to private member, new delete operator, dynamic memory,

Binding in C++, virtual function, rule for virtual function, pointer to derive class object, pure virtual function, constructor and virtual functions, polymorphism, file, file operator and commands, use in C++, templates.

Single linked lists, double linked list, circular list, sparse table, stack, queue, d-queue list, priority queue, graph, prefix, postfix, infix, sorting, insertion, selection, bubble, algorithm of quick, merge

Reference Books:
1. Object Oriented Programming with C++, E. Balagurusamy, Tata McGraw Hill.

2. Data Structures and algorithms in C++, Adam Drozdex, Vikas Publications

3. Understanding Programming an introduction using C++, Scott R Canon, Vikas Publications.

4. OOPS with C++, N P Bhave,

5. OOPS with ANSI C++, A N Kamthane,

Duration 3 hours   *Max Marks 80*

MCS – 202 ADVANCE DATABASE MANAGEMENT SYSTEMS

Object Oriented modeling, class, different types of attributes, generalization, inheritance, aggregation, encapsulation, complex objects, object definition language, object query language, object technology in RDBMS, primary, secondary, multi-level files, dynamic multi-level index using B & B+ tree,

Distributed database design, architecture of distributed processing system, data communication concept, data placement, placement of DDBMS, and other components, concurrency control techniques, recovery, transaction management, need of recovery, recovery techniques, serializability, two-phase locking.

Query optimization and processing, algorithm for external sorting, select and join, object and set operations, heuristics in query optimization, temporal database concept, multi-media database, Security and integrity of databases, security specifications in SQL, access control, flow control.

SQL*PLUS Data types, Constraints, Operators, DDL, DML, PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions. Stored procedures & functions, creation and execution of procedures

Database Triggers: Introduction, Use & type of database Triggers, Triggers Vs. Declarative Integrity Constraints, BEFORE Vs. AFTER Trigger Combinations, Creating a Trigger, Dropping a Trigger.

Introduction to DB2, architecture, defining database, manipulating database, external views, DB2 internals, IMS architecture, IMS physical database, IMS logical database

Introduction to RPG/400 programming, report heading, editing, eval expression, arithmetic functions, RPG/400 structure operations for decision making, branching, looping control, sub-routines, array, table processing, RPG/400 functions, data validation, physical file maintenance.

Reference Books:

1. SQL Complete Reference, Leon and Leon, Tata McGraw Hill

2. SQL, PL/SQL Programming Language, Ivan Bayross, BPB Publica-

tions

3. DB2 Developer's Guide, Mullins, BPB Publications

4. Data Base Management System, Navathe, Pearson Education Asia.

Duration 3 hours   *Max Marks 80*

MCS – 203 SOFTWARE ENGINEERING

Concepts of Software Engineering, Software Characteristics, components applications, software Metrics and Models; Process and Product Metrics, Size metric, Complexity metric, McCabe's Cyclometic Complexity, Halsted Theory, Function Point Analysis.

System Development Life Cycle (SDLC) Steps, Water fall model, Prototypes, Spiral model. Planning and Software Project: Cost Estimation, Project Scheduling, Quality Assurance Plans, Project Monitoring Plans.

Software Development & Software Design : System design, detailed design, function oriented design, object oriented design user Interface design, Design level metrics: Phases, Process Models, Role of Management; Role of Metrics and Measurement, Software Quality factors,

Coding and Testing: Programming Practices, verification, Monitoring and Control. Testing level metrics Software quality and reliability Clean room approach, software reengineering.

Testing : Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan activities during testing, Unit System , Integration Testing.

Reference:

1. Software Engineering Fundamentals, Ali Behforooz, Oxford University Press.

2. Software Engineering, Pressman, R. S. Pressman & Associates.

3. Software Engineering, Sommerville, Addison Wesley

Duration 3 hours   *Max Marks 80*

MCS – 204 DATA WAREHOUSING

Data Warehousing: Introduction to Data Warehouse, Data warehouse uses, Data Warehouse Planning stages and Designing approaches, Delivery Process - Data Warehouse Delivery Methods.

System Processes: Data in Flow Process, Extract and load process, Clean and Transform Process, Backup and Archive process and Query Management Process. Process Architecture-Load Manager, Warehouse Manager, Query Manager.

Database Schema - Star flake schema, Identifying facts and dimensions, Designing fact tables and dimension tables, Designing Star flake schema Multi-dimension schemas Horizontal and vertical partitioning, Hardware partitioning.

Aggregations and aggregation summary tables, Data Marts, Designing data Marts Metadata - Data transformation and load, Data management, Query generation, Metadata and tools Data Warehouse Process and Load Managers

Reference Books:
1. Data Warehousing in the Real world", Anahory S, Murray D, Addison Wesley
2. Building the Data Warehouse, Inmon W. H. Wiley Dreamtech

Duration 3 hours   *Max Marks 80*

MCS –205 IMAGE PROCESSING

Image representation, bitmap representation, bitmap header, color map, 8 bit, 24 bit pixels, TIFF, PCX, JPEG format,.

Image smoothing, zooming, transform operation, multi-spectral image enhancement, convolution techniques, formulation of discrete linear operators, inverse and Wiener filtering

Edge detection, segmentation, texture, motion detection, error criterion, lossy compression, methods of putting data on diet, trie-based codes, fractal image coding, subband coding of images

Fingerprints, face recognition, speaker recognition, digital watermarking for images, medical image processing.

Reference: "

Digital Image Processing and Analysis, Chanda Mazumdar, PHI, India

Duration 3 hours   *Max Marks 80*

MCS – 206 ARTIFICIAL INTELLIGENCE

Definition of AI, Application of AI, knowledge-based systems, representation of knowledge organization and acquisition of knowledge.

Introduction of prolog, variable, object, domain, clauses, recursion basic list manipulation function, predicates, input, output, local variables, iteration, recursion, arrays, database in prolog, rule order, goal order, cut trial prolog query.

Syntax, semantics of propsitional logic, syntax and semantics of FOPL, conversion to clausal form, inference rule, resolution principles, non-deductive inference methods, representation using rules, truth maintenance system, predicate completion and circumscription, modal and temporal logics, fuzzy logic.

Bayesian probabilistic inference, possible word representation, Dempster-Shafer Theory, Ad-Hoc methods, associative networks, frame networks, search problems, uniformed or blind search, searching and-or graph

Duration 3 hours   *Max Marks 80*

MCS – 207 XML TECHNOLOGY

Role Of XML - XML and The Web - XML Language Basics - SOAP - Web Services - Revolutions Of XML - Service Oriented Architecture (SOA).

XML TECHNOLOGY - XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure.

SOAP, Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns And Faults - SOAP With Attachments.

WEB SERVICES: Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

XML SECURITY: Security Overview - Canonicalization - XML Security Framework - XML Encryption - XML Digital Signature - XKMS Structure - Guidelines For Signing XML Documents - XML In Practice.

Reference books:
1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, " Developing Java Web Services", Wiley Publishing Inc.,
3. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.

O P T I O N A L

Duration 3 hours   *Max Marks 80*

MCS – 208a WEB TECHNOLOGY

Internet – current state, hardware and software requirement, ISP, an internet account, web home page, URL, browser, security on web, searching tools, search engines, FTP, Gopher, Telnet, emails

Introduction to Java, characteristics, Object oriented programming, data types, variables, arrays Control statements: selection, iteration, jump statements, operators

Introduction to classes, class fundamentals, constructor, methods, stack class, inheritance, creating multilevel hierarchy, method over riding

Packages and interfaces, exception handling, multi-threaded programming, I/O applets Java Library, string handling, string comparison, string buffer

JavaScript, comment types, JavaScript reserved words, identifiers, events, primitive data types, escape sequences, data type conversion func-

tions and methods, operators, control structures and statements objects, applet fundamentals, applet life cycle, local and remote applet applications, tags, creating and passing parameters to applets, exception handling.

Reference books:-

1. Introduction to Java Programming, Y. Daniel Liang, PHI.
2. Java Complete Reference, Patrick Naughton, Tata McGraw Hill.
3. The Java Handbook, Patrick Naughton, Tata McGraw Hill.
4. Introduction to Java Programming, E Balaguruswamy, PHI.
5. Programming Java, Decker & Hirshfield, Vikas Publications

Duration 3 hours   *Max Marks 80*

MCS – 208b SPATIAL DATABASE MANAGEMENT SYSTEM

Introduction to GIS, history, definition, hardware and software, raster based GIS, data acquisition, nature of spatial data, geo-referencing.

GIS functionality, data models, raster, vector, object oriented, coordinate system and geo-coding, data structures

Introduction to ArcView, Creating maps, adding tabular data, choosing map projection, attribute features, aggregating data, creating and editing spatial data.

Introduction to ArcAvenue, data types, string, numbers, geo-coding, script writing, loops, interacting with views and themes, graphics, creating layout.

Reference Books:

1. ARC Macro Language - Developing ArcInfo Menus, Macros with AML, Longman, ESRI
2. Geographical Information System, Tor Bernhardsen, Longman
3. Computer Vision and Image Processing, Scott E Umbaugh, PHI
4. Inside ArcInfo, Michael Zeiler, Onward Press
5. Inside MapInfo Professionals, Larry Daniel, Onward Press
6. Principal of GIS, Peter and McDonald, Longman.

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