JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Established by an Act No.30 of 2008 of A.P. State Legislature)
Kukatpally, Hyderabad – 500 085, Andhra Pradesh (India)

M. TECH. WEB TECHNOLOGIES

COURSE STRUCTURE AND SYLLABUS

I Year -I Semester

Code	Group	Subject	L	T/P/D	C
		Advanced Data Structures and Algorithms	3	0	3
		Advanced Java & Web Programming	3	0	3
		Advanced Databases	3	0	3
		Grid and Cloud Computing	3	0	3
	Elective -I	Software Process and Project Management Advanced Network Programming Database Security	3	0	3
	Elective -II	Web Data Mining E-Commerce Software Quality Assurance and Testing	3	0	3
	Lab	Java & Web Programming Lab	0	3	2
		Seminar	-	-	2
		Total	**18**	**3**	**22**

I Year -II Semester

Code	Group	Subject	L	T/P/D	C
		Scripting Languages	3	0	3
		Web Services and Service Oriented Architecture	3	0	3
		Semantic Web & Social Networks	3	0	3
		Web Security	3	0	3
	Elective -III	Advanced Data Mining Multimedia and Rich Internet Applications Storage Area Networks	3	0	3
	Elective -IV	Information Retrieval Systems Business Intelligence & Big Data Software Architecture and Design Patterns	3	0	3
	Lab	Web Services Lab	0	3	2
		Seminar	-	-	2
		Total	**18**	**3**	**22**

II Year -I Semester

Code	Group	Subject	L	T/P/D	C
		Comprehensive Viva	-	-	2
		Project Seminar	0	3	2
		Project Work	-	-	18
		Total	**-**	**3**	**22**

II Year -II Semester

Code	Group	Subject	L	T/P/D	C
		Project Work and Seminar	-	-	22
		Total	**-**	**-**	**22**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – I Sem. (Web Technologies)

ADVANCED DATA STRUCTURES AND ALGORITHMS

Objectives:
- The fundamental design, analysis, and implementation of basic data structures.
- Basic concepts in the specification and analysis of programs.
- Principles for good program design, especially the uses of data abstraction.
- Significance of algorithms in the computer field
- Various aspects of algorithm development
- Qualities of a good solution

UNIT I
Algorithms, Performance analysis- time complexity and space complexity, Asymptotic
Notation-Big Oh, Omega and Theta notations, Complexity Analysis Examples.
Data structures-Linear and non linear data structures, ADT concept, Linear List ADT, Array
representation, Linked representation, Vector representation, singly linked lists -insertion, deletion,
search operations, doubly linked lists-insertion, deletion operations, circular lists.
Representation of single, two dimensional arrays, Sparse matrices and their representation.

UNIT II
Stack and Queue ADTs, array and linked list representations, infix to postfix conversion using stack,
implementation of recursion, Circular queue-insertion and deletion, Dequeue ADT, array and linked
list representations, Priority queue ADT, implementation using Heaps, Insertion into a Max Heap,
Deletion from a Max Heap, java.util package-ArrayList, LinkedList, Vector classes, Stacks and
Queues in java.util, Iterators in java.util.

UNIT III
Searching–Linear and binary search methods, Hashing-Hash functions, Collision Resolution
methods-Open Addressing, Chaining, Hashing in java.util-HashMap, HashSet, Hashtable .
Sorting –Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort, comparison of
sorting methods.

UNIT IV
Trees- Ordinary and Binary trees terminology, Properties of Binary trees, Binary tree ADT,
representations, recursive and non recursive traversals, Java code for traversals, Threaded binary
trees.
Graphs- Graphs terminology, Graph ADT, representations, graph traversals/search methods-dfs and
bfs, Java code for graph traversals, Applications of Graphs-Minimum cost spanning tree using
Kruskal's algorithm, Dijkstra's algorithm for Single Source Shortest Path Problem.

UNIT V
Search trees- Binary search tree-Binary search tree ADT ,insertion, deletion and searching
operations, Balanced search trees, AVL trees-Definition and examples only, Red Black trees –
Definition and examples only, B-Trees-definition, insertion and searching operations, Trees in java.
util-TreeSet, TreeMap Classes, Tries(examples only),Comparison of Search trees.
Text compression-Huffman coding and decoding, Pattern matching-KMP algorithm.

TEXT BOOKS:
1. Data structures, Algorithms and Applications in Java, S.Sahni, Universities Press.
2. Data structures and Algorithms in Java, Adam Drozdek, 3rd edition, Cengage learning.
3. Data structures and Algorithm Analysis in Java, M.A. Weiss, 2nd edition, Addison-Wesley
   (Pearson Education).

REFERENCE BOOKS:
1. Java for Programmers, Deitel and Deitel, Pearson education.
2. Data structures and Algorithms in Java,R.Lafore, Pearson education.
3. Java: The Complete Reference, 8th edition, Herbert Schildt, TMH.
4. Data structures and Algorithms in Java, M.T.Goodrich, R.Tomassia, 3rd edition, Wiley India
   Edition.
5. Data structures and the Java Collection Frame work, W.J.Collins, Mc Graw Hill.

6. Classic Data structures in Java, T.Budd, Addison-Wesley (Pearson Education).
7. Data structures with Java, Ford and Topp, Pearson Education.
8. Data structures using Java, D.S.Malik and P.S.Nair, Cengage learning.
9. Data structures with Java, J.R.Hubbard and A.Huray,PHI Pvt. Ltd.
10. Data structures and Software Development in an Object-Oriented Domain, J.P.Tremblay and G.A.Cheston, Java edition, Pearson Education.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – I Sem. (Web Technologies)

ADVANCED JAVA & WEB PROGRAMMING

Objectives:
- To learn the basics of java Console and GUI based programming
- To introduce XML and processing of XML Data with Java
- To introduce Server side programming with Java Servlets and JSP
- To introduce Client side scripting with Javascript and AJAX.

UNIT I
HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;
Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script, CSS

UNIT II
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX
Review of Applets, Class, Event Handling, AWT Programming.
Introduction to Swing: JApplet, Handling Swing Controls like Icons – Labels – Buttons – Text Boxes – Combo – Boxes – Tabbed Pains – Scroll Pains – Trees – Tables Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

UNIT III
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API.
Web servers: Tomcat Server installation & Testing.
Introduction to Servelets: Lifecycle of a Serverlet, JSDK The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters.

UNIT IV
More on Servlets: The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC architecture. AJAX.

UNIT V
JSP Application Development: Generating Dynamic Content, Using Scripting Elements
Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations
Database Access Database Programming using JDBC Studying Javax.sql.* package Accessing a Database from a JSP Page Application – Specific Database Actions Deploying JAVA Beans in a JSP Page

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition,
     WILEY Dreamtech (UNIT 1,2)
2. The complete Reference Java 2 Fifth Edition ,Patrick Naughton and Herbert Schildt., TMH (Chapters: 25) (UNIT 2,3)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 3,4,5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson
2. Core SERVLETS ANDJAVASERVER PAGES   VOLUME 1: CORE
     TECHNOLOGIES, Marty Hall and Larry Brown Pearson

3. Internet and World Wide Web – How to program, Dietel and Nieto PHI/Pearson.
4.   Jakarta Struts Cookbook, Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Professional Java Server Programming, S.Allamaraju and othersApress (dreamtech).
8. Java Server Programming ,Ivan Bayross and others, The X Team,SPD
9. Web Warrior Guide to Web Programming -Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.
12. Java Script, D.Flanagan, O'Reilly,SPD.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – I Sem. (Web Technologies)

ADVANCED DATABASES

Objectives:
By the end of the course, you will know:
- History and Structure of databases
- How to design a database
- How to convert the design into the appropriate tables
- Handling Keys appropriately
- Enforcing Integrity Constraints to keep the database consistent
- Normalizing the tables to eliminate redundancies
- Querying relational data
- Optimizing and processing the queries
- Storage Strategies for easy retrieval of data through index
- Triggers, Procedures and Cursors ,Transaction Management
- Distributed databases management system concepts and Implementation

UNIT I
Database System Applications, Purpose of Database Systems, View of Data – Data Abstraction, Instances and Schemas, Data Models – the ER Model, Relational Model, Other Models – Database Languages – DDL,DML, Database Access from Applications Programs, Transaction Management, Data Storage and Querying, Database Architecture, Database Users and Administrators, ER diagrams,. Relational Model: Introduction to the Relational Model – Integrity Constraints Over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views –Altering Tables and Views, Relational Algebra, Basic SQL Queries, Nested Queries, Complex Integrity Constraints in SQL, Triggers

UNIT II
Introduction to Schema Refinement – Problems Caused by redundancy, Decompositions – Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms – FIRST, SECOND, THIRD Normal forms – BCNF –Properties of Decompositions- Loss less- join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form, Join Dependencies, FIFTH Normal form.

UNIT III
Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions – Lock Based Concurrency Control, Deadlocks – Performance of Locking – Transaction Support in SQL.
Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions, Dealing with Deadlocks, Specialized Locking Techniques – Concurrency Control without Locking.
Crash recovery: Introduction to Crash recovery, Introduction to ARIES, the Log , Other Recovery related Structures, the Write-Ahead Log Protocol, Check pointing, recovering from a System Crash, Media recovery

UNIT IV
Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing – Clustered Indexes, Primary and Secondary Indexes, Index data Structures – Hash Based Indexing, Tree based Indexing
Storing data: Disks and Files: -The Memory Hierarchy – Redundant Arrays of Independent Disks.
Tree Structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM)
B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.
Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendable vs. Linear Hashing.

UNIT V
Distributed databases: Introduction to distributed databases, Distributed DBMS architectures, Storing data in a distributed DBMS, Distributed catalog management, Distributed query processing

Updating distributed data, Distributed transactions, Distributed concurrency control, Distributed recovery

TEXT BOOKS:

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, TMH, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw hill, VI edition, 2006.
3. Fundamentals of Database Systems 5th edition. Ramez Elmasri, Shamkant B.Navathe, Pearson Education, 2008.

REFERENCE BOOKS:

1. Introduction to Database Systems, C.J.Date, Pearson Education.
2. Database Management System Oracle SQL and PL/SQL, P.K.Das Gupta, PHI.
3. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
4. Database Systems, A Practical approach to Design Implementation and Management Fourth edition, Thomas Connolly, Carolyn Begg, Pearson education.
5. Database-Principles, Programming, and Performance, P.O'Neil & E.O'Neil, 2nd ed., ELSEVIER
6. Fundamentals of Relational Database Management Systems, S.Sumathi, S.Esakkirajan, Springer.
7. Introduction to Database Management, M.L.Gillenson and others, Wiley Student Edition.
8. Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group.
9. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti,TMH.
10. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez , Pearson Education, 2nd Edition.
11. Distributed Database Systems, Chhanda Ray, Pearson.
12. Distributed Database Management Systems, S.K.Rahimi and F.S.Haug, Wiley.

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GRID AND CLOUD COMPUTING

Objectives:
- To implement Basics, techniques and tools for Grid & Cloud Computing.
- To understand any kind of heterogeneous resources over a network using open standards.
- To implement the Service models.

UNIT I
System models for advanced computing –clusters of cooperative computing, grid computing and cloud computing; software systems for advanced computing-service oriented software and parallel and distributed programming models with introductory details, Features of grid and cloud platform.

UNIT II
Cloud Computing services models and features in Saas , Paas and Iaas.
Service oriented architecture and web services; Features of cloud computing architectures and simple case studies.

UNIT III
Virtualization- Characteristic features, Taxonomy Hypervisor, Virtualization and Cloud Computing, Pros and Cons of Cloud Computing, Technology Examples/Case Studies.

UNIT IV
Cloud programming Environmental- Map Reduce Hadoop Library from Apache, Open Source Cloud Software Systems –Eucalyptus.

UNIT V
Grid Architecture and Service modeling, Grid resource management, Grid Application trends.

TEXT BOOKS:

1. Distributed and Cloud Computing, Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier India 2012.
2. Mastering Cloud Computing- Raj Kumar Buyya, Christian Vecchiola and S.Tanurai Selvi, TMH, 2012.

REFERENCE BOOKS:

1. Cloud Computing, John W. Ritting House and James F Ramsome, CRC Press, 2012.
2. Enterprise Cloud Computing, Gautam Shroff, Cambridge University Press, 2012.

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M. Tech – I Year – I Sem. (Web Technologies)

SOFTWARE PROCESS AND PROJECT MANAGEMENT
(ELECTIVE – I)

Objectives:
- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

UNIT I
Software Process Maturity Software maturity Framework**,** Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process.
Process Reference Models Capability Maturity Model (CMM)**,** CMMi, PCMM, PSP, TSP.

UNIT II
Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.
Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT III
Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments.
Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT IV
Project Organizations Line-of- business organizations, project organizations, evolution of organizations, process automation.
Project Control and process instrumentation The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

UNIT V
CCPDS-R Case Study and Future Software Project Management Practices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS:
1. Managing the Software Process, *Watts S. Humphrey*, Pearson Education,1999
2. Software Project Management, *Walker Royce,* Pearson Education,1998

REFERENCE BOOKS:
1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth edition, Wiley India, rp2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000
3. Process Improvement essentials, James R. Persse, O'Reilly, 2006
3. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
4. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
5. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly, 2007
6. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, 2nd edition, Wiley India, 2004.
7. The Art of Project Management, Scott Berkun, SPD, O'Reilly, 2011.
8. Applied Software Project Management, Andrew Stellman & Jennifer Greene, SPD, O'Reilly, rp2011.
9. Agile Project Management, Jim Highsmith, Pearson education, 2004.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
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ADVANCED NETWORK PROGRAMMING
(ELECTIVE – I)

Objectives:
Computer network programming involves writing computer programs that enable processes to communicate with each other across a computer network
Network programming is client–server programming
Interprocess communication, even if it is bidirectional, cannot be implemented in a perfectly symmetric way: to establish a communication channel between two processes, one process must take the initiative, while the other is waiting for it. Therefore, network programming unavoidably assumes a client–server model: The process initiating the communication is a client, and the process waiting for the communication to be initiated is a server. The client and server processes together form a distributed system. In a peer-to-peer communication, the program can act both as a client and a server.

UNIT I
Linux Utilities- File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking utilities, Filters, Text processing utilities and Backup utilities.
 Bourne again shell(bash) - Introduction, pipes and redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples.
Review of C programming concepts-arrays, strings (library functions), pointers, function pointers, structures, unions, libraries in C.

UNIT II
 Files- File Concept, File types File System Structure, Inodes, File Attributes, file I/O in C using system calls, kernel support for files, file status information-stat family, file and record locking-lockf and fcntl functions, file permissions- chmod, fchmod, file ownership-chown, lchown ,fchown, links-soft links and hard links – symlink, link, unlink.
 File and Directory management – Directory contents, Scanning Directories- Directory file APIs.
 Process- Process concept, Kernel support for process, process attributes, process control – process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process.

UNIT III
Signals- Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.
Interprocess Communication - Introduction to IPC mechanisms, Pipes- creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions, Introduction to message queues, semaphores and shared memory.
Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.
Semaphores-Kernel support for semaphores, Unix system V APIs for semaphores.

UNIT IV
Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, client/server example.
Network IPC - Introduction to Unix Sockets, IPC over a network, Client-Server model ,Address formats(Unix domain and Internet domain), Socket system calls for Connection Oriented - Communication ,Socket system calls for Connectionless-Communication, Example-Client/Server Programs- Single Server-Client connection, Multiple simultaneous clients, Socket options – setsockopt, getsockopt , fcntl.

UNIT V
Network Programming in Java-Network basics, TCP sockets, UDP sockets (datagram sockets), Server programs that can handle one connection at a time and multiple connections (using

multithreaded server), Remote Method Invocation (Java RMI)-Basic RMI Process, Implementation details-Client-Server Application.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI (Units II, III, IV)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.(Unit I)
3. An Introduction to Network Programming with Java, Jan Graba, Springer, rp 2010.(Unit V)
4. Unix Network Programming ,W.R. Stevens, PHI.(Units II,III,IV)
5. Java Network Programming,3rd edition, E.R. Harold, SPD, O'Reilly.(Unit V)

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
4. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition.
5. Unix Network Programming The Sockets Networking API, Vol.-I,W.R.Stevens, Bill Fenner, A.M.Rudoff, Pearson Education.
6. Unix Internals, U.Vahalia, Pearson Education.
7. Unix shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.
8. C Programming Language, Kernighan and Ritchie, PHI

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DATABASE SECURITY
(ELECTIVE – I)

Objectives:
- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

UNIT I
Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions
Security Models -1: Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

UNIT II
Security Models -2: Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's
Model The Lattice Model for the Flow Control conclusion
Security Mechanisms Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

UNIT III
Security Software Design Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design

UNIT IV
Statistical Database Protection & **Intrusion Detection Systems** Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison .Introduction IDES System RETISS System ASES System Discovery

UNIT V
Models For The Protection Of New Generation Database Systems -1 Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases
Models For The Protection Of New Generation Database Systems -2 A Model for the Protection of New Generation Database Systems: the Orion Model Jajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

TEXT BOOKS:
1. Database Security and Auditing, Hassan A. Afyouni, India Edition, CENGAGE Learning, 2009.
2. Database Security, *Castano,* Second edition, Pearson Education.

REFERENCE BOOK:

1. Database security by alfred basta, melissa zgola, CENGAGE learning.

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WEB DATA MINING
(ELECTIVE –II)

Objectives:
- To describe web mining and understand the need for web mining
- To differentiate between Web mining and data mining
- To understand the different application areas for web mining
- To understand the different methods to introduce structure to web-based data
- To describe Web mining, its objectives, and its benefits
- To understand the methods of Web usage mining

UNIT I
Introduction to Web Data Mining and Data Mining Foundations
Introduction – World Wide Web(WWW), A Brief History of the Web and the Internet, Web Data Mining-Data Mining, Web Mining.
Data Mining Foundations – Association Rules and Sequential Patterns – Basic Concepts of Association Rules, Apriori Algorithm- Frequent Itemset Generation, Association Rule Generation, Data Formats for Association Rule Mining, Mining with multiple minimum supports – Extended Model, Mining Algorithm, Rule Generation, Mining Class Association Rules, Basic Concepts of Sequential Patterns, Mining Sequential Patterns on GSP, Mining Sequential Patterns on PrefixSpan, Generating Rules from Sequential Patterns.

UNIT II
Supervised and Unsupervised Learning
Supervised Learning - Basic Concepts, Decision Tree Induction – Learning Algorithm, Impurity Function, Handling of Continuous Attributes, Classifier Evaluation, Rule Induction – Sequential Covering, Rule Learning, Classification Based on Associations, Naïve Bayesian Classification , Naïve Bayesian Text Classification - Probabilistic Framework, Naïve Bayesian Model .
Unsupervised Learning – Basic Concepts , K-means Clustering – K-means Algorithm, Representation of Clusters, Hierarchical Clustering – Single link method, Complete link Method, Average link method, Strength and Weakness.
Web Mining

UNIT III
Information Retrieval and Web Search
Basic Concepts of Information Retrieval, Information Retrieval Methods - Boolean Model, Vector Space Model and Statistical Language Model, Relevance Feedback, Evaluation Measures, Text and Web Page Preprocessing – Stopword Removal, Stemming, Web Page Preprocessing, Duplicate Detection, Inverted Index and Its Compression – Inverted Index, Search using Inverted Index, Index Construction, Index Compression, Latent Semantic Indexing – Singular Value Decomposition, Query and Retrieval, Web Search, Meta Search, Web Spamming.

UNIT IV
Link Analysis and Web Crawling
Link Analysis - Social Network Analysis, Co-Citation and Bibliographic Coupling, Page Rank Algorithm, HITS Algorithm, Community Discovery-Problem Definition, Bipartite Core Communities, Maximum Flow Communities, Email Communities.
Web Crawling – A Basic Crawler Algorithm- Breadth First Crawlers, Preferential Crawlers, Implementation Issues – Fetching, Parsing, Stopword Removal, Link Extraction, Spider Traps, Page Repository, Universal Crawlers, Focused Crawlers, Topical Crawlers, Crawler Ethics and Conflicts.

UNIT V
Opinion Mining and Web Usage Mining
Opinion Mining - Sentiment Classification – Classification based on Sentiment Phrases, Classification Using Text Classification Methods, Feature based Opinion Mining and Summarization – Problem Definition, Object feature extraction, Feature Extraction from Pros and Cons of Format1, Feature Extraction from Reviews of Format 2 and 3, Comparative Sentence and Relation Mining, Opinion Search and Opinion Spam.

Web Usage Mining - Data Collection and Preprocessing- Sources and Types of Data, Key Elements of Web usage Data Preprocessing, Data Modeling for Web Usage Mining, Discovery and Analysis of Web usage Patterns -Session and Visitor Analysis, Cluster Analysis and Visitor Segmentation, Association and Correlation Analysis, Analysis of Sequential and Navigation Patterns.

TEXT BOOK:

1. Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data by Bing Liu (Springer Publications)

REFERENCES BOOKS:

1. Data Mining: Concepts and Techniques, Second Edition Jiawei Han, Micheline Kamber (Elsevier Publications)
2. Web Mining:: Applications and Techniques by Anthony Scime
3. Mining the Web: Discovering Knowledge from Hypertext Data by Soumen Chakrabarti

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M. Tech – I Year – I Sem. (Web Technologies)

E-COMMERCE
(ELECTIVE –II)

Objectives:
- To identify the major categories and trends of e-commerce applications.
- To identify the essential processes of an e-commerce system.
- To identify several factors and web store requirements needed to succeed in e-commerce.
- To discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
- To understand the main technologies behind e-commerce systems and how these technologies interact.
- To discuss the various marketing strategies for an online business.
- To define various electronic payment types and associated security risks and the ways to protect against them.

UNIT - I
Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.
Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - II
Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.
Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

UNIT - III
Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.
Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses.

UNIT- IV
Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.
Consumer Search and Resource Discovery-Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT - V
Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK:
1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

REFERENCE BOOKS:
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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M. Tech – I Year – I Sem. (Web Technologies)

SOFTWARE QUALITY ASSURANCE AND TESTING
(ELECTIVE-II)

Objectives:
The student should be able to:

- To understand software testing and quality assurance as a fundamental component of software life cycle
- To define the scope of SW T&QA projects
- To efficiently perform T&QA activities using modern software tools
- To estimate cost of a T&QA project and manage budgets
- To prepare test plans and schedules for a T&QA project
- To develop T&QA project staffing requirements
- To effectively manage a T&QA project

UNIT I
Software Quality Assurance and Standards
The Software Quality challenge, What is Software Quality, Software Quality factors, The components of Software Quality Assurance system, Software Quality Metrics, Costs of Software Quality, Quality Management Standards, Management and its role in Software Quality Assurance, SQA unit and other actors in SQA system. - (Chapters: 1-4, 21-23, 25, 26) of T3
Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma and other latest quality standards (Refer Internet and R11, R12, R13).

UNIT II
Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy
Building Software Testing Process: Software Testing Guidelines, workbench concept, Customizing the Software Testing Process, Process Preparation checklist - (Chapters: 2,3) of T1
Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing -(Chapters: 4, 5, 6, 7, 8) of T2

UNIT III Software Testing Tools
Selecting and Installing Software Testing tools – (Chapter 4) of T1.
Automation and Testing Tools - (Chapter 15) of T2
Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus. (Refer Internet and R9, R10)

UNIT IV Testing Process
Seven Step Testing Process – I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing. (Chapters 6, 7, 8, 9, 10) of T1
UNIT V
Seven Step Testing Process – II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis
Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems (Chapters 12, 13, 14, 15) of T1.

TEXT BOOKS:

1. Effective Methods for Software Testing, Third edition, *William E. Perry*, Wiley India, 2009
2. Software Testing – Principles and Practices, *Naresh Chauhan,* Oxford University Press, 2010.
3. Software Quality Assurance – From Theory to Implementation, *Daniel Galin,* Pearson Education, 2009.

REFERENCE BOOKS:

1. Testing Computer Software, Cem Kaner, Jack Falk, Hung Quoc Nguyen, Wiley India, rp2012.
2. Software Testing – Principles, Techniques and Tools, *M.G.Limaye*, Tata McGraw-Hill, 2009.

3. Software Testing - A Craftsman's approach, *Paul C. Jorgensen*, Third edition, Auerbach Publications, 2010.
4. Foundations of Software Testing, *Aditya P. Mathur*, Pearson Education, 2008.
5. Software Testing and Quality Assurance – Theory and Practice, *Kshirasagar Naik, Priyadashi Tripathy*, Wiley India, 2010.
6. Software Testing, *Ron Patton*, Second edition, Pearson Education, 2006.
7. Software Testing and Analysis – Process, Principles and Techniques, *Mauro Pezze, Michal Young,* Wiley India, 2008.
7. Software Testing Techniques, Boris Beizer, Second edition, Wiley India, 2006
8. Foundations of Software Testing, Dorothy Graham, et al., Cengage learning, 2007, rp 2010.
9. Software Testing - Effective Methods, Tools and Techniques, *Renu Rajani, Pradeep Oak*, Tata McGraw-Hill, rp2011.
10. Software Automation Testing Tools for Beginners, *Rahul Shende*, Shroff Publishers and Distributors, 2012.
11. Software Testing Tools, *K.V.K.K. Prasad*, Dream Tech Press, 2008.
12. Software Testing Concepts and Tools, *Nageswara Rao Pusuluri*, Dream Tech press, 2007.
13. Software Quality Assurance, *Milind Limaye*, Tata McGraw-Hill, 2011.
14. Software Quality – Theory and Management, *Alan C. Gillies*, Second edition, Cengage Learning, 2009.
15. Software Quality – A Practitioner's approach, *Kamna Malik, Praveen Choudhary,* Tata McGraw-Hill, 2008.
16. Software Quality Models and Project Management in a Nutshell, *Shailesh Mehta*, Shroff Publishers and Distributors, 2010.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – I Sem. (Web Technologies)

JAVA & WEB PROGRAMMING LAB

Objectives:

- To enable the student to program web applications using the following technologies
- HTML
- XML
- JavaScript
- Tomcat Server
- Servltes
- JSP

1. Develop static pages (using Only HTML) of an online Book store. The pages should resemble: www.amazon.com The website should consist the following pages.
   - Home page
   - Registration and user Login
   - User Profile Page
   - Books catalog
   - Shopping Cart
   - Payment By credit card
   - Order Conformation

2. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

3. Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

4. Bean Assignments
   a. Create a JavaBean which gives the exchange value of INR(Indian Rupees) into equivalent American/Canadian/Australian Dollar value.
   b. Create a simple Bean with a label - which is the *count* of number of clicks. Than create a BeanInfo class such that only the "*count*" property is visible in the Property Window.
   c. Create two Beans-a)KeyPad .b)DisplayPad .After that integrate the two Beans to make it work as a Calculator.
   d. Create two Beans Traffic Light(Implemented as a Label with only three background colours-Red,Green,Yellow) and Automobile(Implemented as a TextBox which states its state/movement). The state of the Automobile should depend on the following Light Transition Table.

Light Transition	Automobile State
Red ---> Yellow	Ready
Yellow ---> Green	Move
Green --> Red	Stopped

5. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using Servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

6. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

7. Implement the "Hello World!" program using JSP Struts Framework.

TEXT BOOKS:

1. Java Server Programming for Professionals, 2nd Edition, Bayross and others, O'reilly,SPD.
2. JDBC, Servlets, and JSP ,Black Book, K. Santosh Kumar, dreamtech.
3. Core Web Programming, 2nd Edition, Volume 1, M.Hall and L.Brown, PHPTR.
4. Core Web Programming, 2nd Edition, Volume 2, M.Hall and L.Brown, PHPTR.
5. Core Java, Volume 1, Horstman and Cornell, 8th Edition, Pearson Education.
6. Core Java, Volume 2, Horstman and Cornell, 8th Edition, Pearson Education.
7. Java Programming: Advanced Topics, 3rd Edition, J.Wiggles worth and P.McMillan,Thomson.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

SCRIPTING LANGUAGES

Objectives:
- The course demonstrates an in depth understanding of the tools and the scripting languages necessary for design and development of applications dealing with Bio-information/ Bio-data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development.

UNIT I
Introduction to PERL and Scripting
Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines, advance perl - finer points of looping, pack and unpack, filesystem, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

UNIT II
PHP Basics
PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT III
Advanced PHP Programming
Php and Web Forms, Files, PHP Authentication and Methodologies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World – Translating Websites- Updating Web sites Scripts, Creating the Localization Repository, Translating Files, text, Generate Binary Files, Set the desired language within your scripts, Localizing Dates, Numbers and Times.

UNIT IV
TCL – Tk
TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL- eval, source, exec and up level commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding , Perl-Tk.

UNIT V
Python
Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling, Integrated Web Applications in Python – Building Small, Efficient Python Web Systems ,Web Application Framework.

TEXT BOOKS:
1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dreamtech)

REFERENCE BOOKS:
1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python, M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1, I.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.

6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Perl by Example, E.Quigley, Pearson Education.
8. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.
 9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice Hall (Pearson).
11. Perl Power, J.P.Flynt, Cengage Learning.
12. PHP Programming solutions, V.Vaswani, TMH.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

WEB SERVICES AND SERVICE ORIENTED ARCHITECTURE

Objectives:
- To Understand Web Services and implementation model for SOA
- To Understand the SOA, its Principles and Benefits
- To Understand XML concepts
- To Understand paradigms needed for testing Web Services
- To explore different Test Strategies for SOA-based applications
- To implement functional testing, compliance testing and load testing of Web Services
- To Identify bug-finding ideas in testing Web Services

UNIT- I
Evolution and Emergence of Web Services – Evolution of distributed computing. Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA). Introduction to Web Services – The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

UNIT -II
Web Service Architecture – Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services. Describing Web Services – WSDL introduction, non functional service description, WSDL1.1 Vs WSDL 2.0, WSDL document, WSDL elements, WSDL binding, WSDL tools, WSDL port type, limitations of WSDL.

UNIT III
Brief Over View of XML – XML Document structure, XML namespaces, Defining structure in XML documents, Reuse of XML schemes, Document navigation and transformation. SOAP : Simple Object Access Protocol, Inter-application communication and wire protocols, SOAP as a messaging protocol, Structure of a SOAP message, SOAP envelope, Encoding, Service Oriented Architectures, SOA revisited, Service roles in a SOA, Reliable messaging, The enterprise Service Bus, SOA Development Lifecycle, SOAP HTTP binding, SOAP communication model, Error handling in SOAP.

UNIT – IV
Registering and Discovering Services : The role of service registries, Service discovery, Universal Description, Discovery, and Integration, UDDI Architecture, UDDI Data Model, Interfaces, UDDI Implementation, UDDI with WSDL, UDDI specification, Service Addressing and Notification, Referencing and addressing Web Services, Web Services Notification.

UNIT - V
SOA and web services security considerations, Network-level security mechanisms, Application-level security topologies, XML security standards, Semantics and Web Services, The semantic interoperability problem, The role of metadata, Service metadata, Overview of .NET and J2EE, SOA and Web Service Management, Managing Distributed System, Enterprise management Framework, Standard distributed management frameworks, Web service management, Richer schema languages, WS-Metadata Exchange.

TEXT BOOKS:
1. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.
2. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

REFERENCE BOOKS:
1. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
2. Building web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
3. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly, SPD.
4. McGovern, et al., "Java web Services Architecture", Morgan Kaufmann Publishers, 2005.
5. J2EE Wer Services, Richard Monson-Haefel, Pearson Education.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

SEMANTIC WEB & SOCIAL NETWORKS

Objectives:
- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

UNIT I:
Web Intelligence
Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT II:
Knowledge Representation for the Semantic Web
Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL),UML,XML/XML Schema.

UNIT III:
Ontology Engineering
Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

UNIT IV:
Semantic Web Applications, Services and Technology
Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT V:
Social Network Analysis and semantic web
What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

TEXT BOOKS:

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley interscience,2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer, Paul Warren, John Wiley &Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers, (Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.
5. A Semantic Web Primer, G.Antoniou and V.Harmelen, PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

WEB SECURITY

Objectives:
- To learn web security objectives
- To learn about vulnerabilities in web hacking
- To learn about phishing, digital certificates.

UNIT I
The Web Security Landscape: The Web Security Problem, Risk Analysis and Best Practices; **Cryptography and the Web:** Cryptography and Web Security, Working Cryptographic Systems and Protocols, What Cryptography Can't Do? , Legal Restrictions on Cryptography.

UNIT II
The Web's War on Your Privacy: Understanding Privacy, User-Provided Information, Log Files, Understanding Cookies, Web Bugs, Conclusion; **Privacy-Protecting Techniques:** Choosing a Good Service Provider, Picking a Great Password, Cleaning Up After Yourself, Avoiding Spam and Junk Email, Identity Theft; **Privacy-Protecting Technologies:** Blocking Ads and Crushing Cookies, Anonymous Browsing, Secure Email, **Backups and Anti Theft:** Using Backups to Protect Your Data, Preventing theft.

UNIT – III
Physical security for Servers: Planning for the Forgotten Threats, Protecting Computer Hardware, Protecting Your Data, **Host Security for Servers:** Current Host Security Problems, Securing the Host Computer, minimizing Risk by Minimizing Services, Operating Securely, Secure Remote Access and Content Updating, firewalls and the Web, **Securing Web Applications:** A Legacy of Extensibility and Risk, Rules to Code By, Security Using Fields, Hidden Fields and Cookies, Rules for Programming languages, Using PHP Securely, Writing Scripts That Run with Additional Privileges, Connecting to Databases.

UNIT IV
Deploying SSL Server Certificates: Planning for your SSL Server, Creating SSL Servers with FreeBSD, Installing an SSL Certificate on Microsoft IIS, Obtaining a Certificate from a Commercial CA, When Things Go Wrong; **Securing Your Web Service:** Protecting Via Redundancy, Protecting Your DNS, Protecting Your Domain Registration.

UNIT V
Controlling Access to Your Web Content: Access Control Strategies, Controlling Access with Apache, Controlling Access with Microsoft IIS; **Client-Side Digital Certificates:** Client Certificates, A Tour of the VeriSign Digital ID Center; **Pornography, Filtering Software and Censorship:** Pornography Filtering, PICS, RSAC, **Privacy Policies, Legislation and P3P:** Policies that Protect Privacy and Privacy Policies, Children's Online Privacy Protection Act, P3P.

TEXT BOOK:

1. Web Security, Privacy & Commerce: Simson Garfinkel, Gene Spafford, SPD O'reilly.

REFERENCE BOOKS:

1. Web Application Security: Bryan Sullivan, Vincent Liu, Mc Graw Hill.
2. Web Application Hacker's Handbook: Dafydd Stuttard, Marcus Pinto, 2nd Edition, Wiley India.
3. Hacking Exposed Web Applications 3: Joel Scambray, Vincent Liu, Caleb Sima, TMH.

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M. Tech – I Year – II Sem. (Web Technologies)

ADVANCED DATA MINING
(ELECTIVE –III)

Objectives:
- To develop the abilities of critical analysis to data mining systems and applications.
- To implement practical and theoretical understanding of the technologies for data mining
- To understand the strengths and limitations of various data mining models**;**

UNIT-I
Data mining Overview and Advanced Pattern Mining
Data mining tasks – mining frequent patterns, associations and correlations, classification and regression for predictive analysis, cluster analysis , outlier analysis; advanced pattern mining in multilevel, multidimensional space – mining multilevel associations, mining multidimensional associations, mining quantitative association rules, mining rare patterns and negative patterns.

UNIT-II
Advance Classification
Classification by back propagation, support vector machines, classification using frequent patterns, other classification methods – genetic algorithms, roughest approach, fuzz>set approach;

UNIT-III
Advance Clustering
Density - based methods –DBSCAN, OPTICS, DENCLUE; Grid-Based methods – STING, CLIQUE; Exception – maximization algorithm; clustering High- Dimensional Data; Clustering Graph and Network Data.

UNIT-IV
Web and Text Mining
Introduction, web mining, web content mining, web structure mining, we usage mining, Text mining – unstructured text, episode rule discovery for texts, hierarchy of categories, text clustering.

 UNIT-V
Temporal and Spatial Data Mining
Introduction; Temporal Data Mining – Temporal Association Rules, Sequence Mining, GSP algorithm, SPADE, SPIRIT Episode Discovery, Time Series Analysis, Spatial Mining – Spatial Mining Tasks, Spatial Clustering. Data Mining Applications.

TEXT BOOKS:
1. Data Mining Concepts and Techniques, Jiawei Hang Micheline Kamber, Jian pei, Morgan Kaufmannn.
2. Data Mining Techniques – Arun K pujari, Universities Press.

REFERENCE BOOKS:

1. Introduction to Data Mining – Pang-Ning Tan, Vipin kumar, Michael Steinbach, Pearson.
2. Data Mining Principles & Applications – T.V Sveresh Kumar, B.Esware Reddy, Jagadish S Kalimani, Elsevier.

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MULTIMEDIA AND RICH INTERNET APPLICATIONS
(ELECTIVE –III)

Objectives:
This course aims to further develop students' competency in producing dynamic and creative graphic solutions for multimedia productions. It provides students with the basic concepts and techniques of interactive authoring. It also introduces students with the advanced scripting skills necessary for implementing highly interactive, rich internet applications using multimedia technologies and authoring tools. Students will develop aesthetic value and competencies in multimedia authoring. Artistic visual style and layout design are stressed, as well as the editing and integration of graphic images, animation, video and audio files. The course allows students to master industry-wide software and technologies to create highly interactive, rich internet applications.

UNIT I
Introduction to Multimedia
Internet and Multimedia communications, Multimedia Networks, Multimedia Applications, Multimedia Information representation- Digitization Principles, Text, Images, Audio and Video, Compression Methods-Basic Coding Methods – Run Length coding, Huffman coding, Arithmetic coding, Discrete Cosine Transform, Differential PCM, Motion Compensated Prediction, Video Compression – JPEG, H.261, MPEG-1 Video, MPEG 2 and 3 Video, H.263, Wavelet and Fractal Image Compression, Audio Compression.

UNIT II
Multimedia Applications in Networks.
Introduction, Application Level Framing, Audio/Video Conferencing-Session Directories, Audio/Video Conferencing, Adaptive Applications, Receiver Heterogeneity, Real Time Application with Resource Reservation ,Video Server, Applications requiring reliable multicast – White Board , Network Text Editor for Shared Text Editing, Multi Talk, Multicast file transfer, Multimedia Applications on the World Wide Web – Multicast Web Page Sharing, Audio/Video Streams in the www, Interactive Multiplayer Games.

UNIT III
Web 2.0
What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

UNIT IV
Rich Internet Applications (RIAs) with Adobe Flash and Flex
Adobe Flash- Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.
Adobe Flex 2- Introduction, Flex Platform Overview, Creating a Simple User Interface, Accessing XML data from your application, Interacting with Server Side Applications, Customizing your User Interface, Creating Charts and Graphs, Connection Independent RIAs on the desktop -Adobe Integrated Runtime (AIR), Flex 3 Beta.

UNIT V
Ajax- Enabled Rich Internet Application
Introduction, Traditional Web Applications Vs Ajax Applications, Rich Internet Application with Ajax, History of Ajax, Raw Ajax example using xml httprequest object, Using XML, Creating a full scale Ajax Enabled application, Dojo ToolKit.

TEXT BOOKS:
   1. Multimedia Communications: Protocols and Applications, Franklin F Kuo,   J.Joaquin Garcia, Wolf gang Effelsberg, Prentice Hall Publications.
     2. Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall,

Addison Wesley Publications.
3. AJAX, Rich Internet Applications, and Web Development for Programmers, Paul J Deitel and Harvey M Deitel, Deitel Developer Series, Pearson education.

REFERENCE BOOKS:

1. Professional Adobe Flex 2, Rich Tretola, Simon barber and Renaun Erickson, Wrox, Wiley India Edition.
2. Multimedia Information Networking, Nalin K Sharda,PHI Learning.
3. Multimedia Computing, Communications & Applications, Ralf Steinmetz and Klara Nahrstedt,Pearson Education.
4. Multimedia Communication Systems: techniques, standards and networks, K.R.Rao, Bojkovic and Milovanovic, PHI Learning.
5. Programming Flex 3, C.Kazoun and J.Lott,SPD.
6. Dojo, J.E.Harmon, Pearson Education.
7. Adobe Flex 3: Training from the Source, Tapper & others, Pearson Education.
8. Principles of Multimedia, R.Parekh, TMH.
9. Mastering Dojo, R.Gill, C.Riecke and A.Russell, SPD.

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STORAGE AREA NETWORKS
(ELECTIVE –III)

Objectives:
- To understand Storage Area Networks characteristics and components.
- To become familiar with the SAN vendors and their products
- To learn Fibre Channel protocols and how SAN components use them to communicate with each other
- To become familiar with Cisco MDS 9000 Multilayer Directors and Fabric Switches Thoroughly learn Cisco SAN-OS features.
- To understand the use of all SAN-OS commands. Practice variations of SANOS features

UNIT I
Introduction to Storage Technology Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

UNIT II
Storage Systems Architecture Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system

UNIT III
Introduction to Networked Storage Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfills the need , Understand the appropriateness of the different networked storage options for different application environments

UNIT IV
Information Availability & Monitoring & Managing Datacenter List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures, Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities
Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center

UNIT V
Securing Storage and Storage Virtualization Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes
Case Studies
The technologies described in the course are reinforced with EMC examples of actual solutions.
Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOK:
1. EMC Corporation, Information Storage and Management, Wiley.

REFERENCE BOOKS:
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill, Osborne, 2001.
4. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2002.

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INFORMATION RETRIEVAL SYSTEMS
(ELECTIVE –IV)

Objectives:
On completion of this course you should have gained a good understanding of the foundation concepts of information retrieval techniques and be able to apply these concepts into practice. Specifically, you should be able to:

- To use different information retrieval techniques in various application areas
- To apply IR principles to locate relevant information large collections of data
- To analyze performance of retrieval systems when dealing with unmanaged data sources
- To implement retrieval systems for web search tasks.

UNIT I
Boolean retrieval. The term vocabulary and postings lists. Dictionaries and tolerant retrieval. Index construction. Index compression.

UNIT II
Scoring, term weighting and the vector space model. Computing scores in a complete search system. Evaluation in information retrieval. Relevance feedback and query expansion.

UNIT III
XML retrieval. Probabilistic information retrieval. Language models for information retrieval. Text classification. Vector space classification.

UNIT IV
Support vector machines and machine learning on documents. Flat clustering. Hierarchical clustering. Matrix decompositions and latent semantic indexing.

UNIT V
Web search basics. Web crawling and indexes. Link analysis.

TEXT BOOK:

1. Introduction to Information Retrieval , Christopher D. Manning and Prabhakar Raghavan and Hinrich Schütze, Cambridge University Press, 2008.

REFERENCE BOOKS:

1. Information Storage and Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Springer.
2. Modern Information Retrieval, Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics, David A Grossman and Ophir Frieder, 2nd Edition, Springer, 2004.
4. Information Retrieval Data Structures and Algorithms, William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
5. Information Storage & Retrieval, Robert Korfhage, John Wiley & Sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

BUSINESS INTELLIGENCE & BIG DATA
(ELECTIVE –IV)

Objectives:
- To understand and explain some of the uses of big data and business intelligence in accounting, auditing and business.
- To learn about some cases those are useful for studying big data, business intelligence.
- To learn about some research issues in big data, business intelligence as they relate to accounting, auditing or business.

UNIT-I
Data Science – Introduction, working with data at scale, data scientist, the SMAQ stack for big data, scraping, cleaning & selling big data
Data Hand Tools - free data tools for journalists.
Data Issues- Introduction, anonymization, risk of de-anonymization, Big data & semantic web, meta data.

UNIT-II
Applications of Data: Product & Process – Twitter archive, data journalism & data tools, newsroom stack, bridging the data divide, data analysis path, Big data in education & academic disciplines, Discussion of Facebook

UNIT-III
BI foundations - Understanding BI, Describing BI, Defining BI cycle, Enabling BI, Bridging the Analysis Gap-Multidimensional analysis, Operation Systems, BI Systems.

UNIT-IV
Defining BI Technologies- The High-level view, Reporting & Analysis, the data warehouse and Data warehousing Framework, Identifying BI opportunities.

UNIT-V
Implementing a BI solution- implementation strategy, Fundamental decisions.
Case studies- Audi AG, The Frank Russell Company.

TEXT BOOKS:
1. Elizabeth Vitt, Michael Luckevich, StaciaMisner, "Business Intelligence", Microsoft Press, 2010.
2. Big Data Now, O'Reily Radar Team.

REFERENCE BOOKS:
1. Rajiv Sabherwal, Irma Becerra- Fernandez, "Business Intelligence-Practices, Technologies and Management", John Wiley 2011.
2. Larissa T. Moss, ShakuAtre, "Business Intelligence Roadmap", Addison –Wesley IT Series.
3. Yuli Vasiliev, "Oracle Business Intelligence: The Condensed Guide to Analysis and Reporting", SPD Shroff, 2012.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

SOFTWARE ARCHITECTURE AND DESIGN PATTERNS
(ELECTIVE –IV)

Objectives:
After completing this course, the student should be able to:
- Understand the concept of patterns and the Catalog.
- Discuss the Presentation tier design patterns and their affect on: sessions, client access, validation and consistency.
- Understand the variety of implemented bad practices related to the Business and Integration tiers.
- Highlight the evolution of patterns.
- How to add functionality to designs while minimizing complexity
- What design patterns really are, and are not
- About specific design patterns.
- What code qualities you need to maintain to keep code flexible.
- How to use design patterns to keep code quality high without overdesign.

UNIT I
Envisioning Architecture The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views.
Creating an Architecture Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT II
Analyzing Architectures Architecture Evaluation, Architecture design decision making, ATAM, CBAM.
Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT III
Patterns Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.
Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight.

UNIT IV
Behavioral patterns Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

UNIT V
Case Studies A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development,

TEXT BOOKS:
1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:
1. Beyond Software architecture, Luke Hohmann, Addison wesley, 2003.
2. Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001
3. Software Design, David Budgen, second edition, Pearson education, 2003
4. Head First Design patterns, Eric Freeman & Elisabeth Freeman, O'REILLY, 2007.
5. Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006
6. J2EE Patterns, Deepak Alur, John Crupi & Dan Malks, Pearson education, 2003.
7. Design Patterns in C#, Steven John metsker, Pearson education, 2004.
8. Pattern Oriented Software Architecture, F.Buschmann & others, John Wiley & Sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech – I Year – II Sem. (Web Technologies)

WEB SERVICES LAB

Objectives:
- To implement the technologies like WSDL, UDDI.
- To learn how to implement and deploy web service client and server

List of Programs:
1. Write a program to implement WSDL Service (Hello Service. WSDL File)
2. Write a program the service provider can be implement a single get price(), static bind() and get product operation.
3. Write a program to implement the operation can receive request and will return a response in two ways.
   a) One-Way operation
   b) Request - Response
4. Write a program to implement to create a simple web service that converts the temperature from Fahrenheit to Celsius (using HTTP Post Protocol)
5. Write a program to implement business UDDI Registry entry
6. Write a program to implement
   a) Web based service consumer
   b) Windows application based web service consumer