

ACADEMIC REGULATIONS
COURSE STRUCTURE AND SYLLABI
FOR
M.TECH.
SOFTWARE ENGINEERING
(Information Technology)

2012-2013



COLLEGE OF ENGINEERING
(AUTONOMOUS)

GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING
(AUTONOMOUS)
ACCREDITED BY NAAC WITH A GRADE WITH A CGPA OF 3.47/4.00
AFFILIATED TO JNTU KAKINADA
MADHURAWADA, VISAKHAPATNAM 530048

Vision

*To evolve into and sustain as a Centre of
Excellence in Technological Education
and Research with a holistic approach.*

Mission

To produce high quality engineering graduates with the requisite theoretical and practical knowledge and social awareness to be able to contribute effectively to the progress of the society through their chosen field of endeavor.

To undertake Research & Development, and extension activities in the fields of Science and Engineering in areas of relevance for immediate application as well as for strengthening or establishing fundamental knowledge.

FOREWORD

It is three years since the G.V.P College of Engineering has become Autonomous with the appreciation and support of erstwhile JNTU and the fast growing new JNTU-K. The college is progressing well with its programmes and procedures drawing more and more accolades from its sister autonomous colleges and higher authorities. The student community, also could adjust well to the new system without any acrimony.

The College is enriched with the experience of running the Post-graduate programmes under Autonomous stream. It is a moment of pride and achievement that the first Autonomous batch of M.Tech in some branches left the college to the satisfaction of all concerned including firms visited the campus for placements.

Another larger than canvas picture is foreseen for the programmes wherein the college is getting the funds through TEQIP - II for up-scaling the PG education and research under sub- component 1.2. In this connection two new PG Programmes have been introduced in Mechanical, Electrical Engineering.

New set of Boards of Studies, Academic council and Governing Body has further strengthened our hands by endorsing the practices and suggested recommendations.

The encouragement given by the affiliating JNTU-K has left no task insurmountable.

Principal

*MEMBERS ON THE BOARD OF STUDIES
IN
CSE,IT,MCA*

- Prof.K.B.Madhuri, Head of the Department IT.

- Dr. B. Yegnanarayana, Professor & Microsoft Chair, Hyderabad.
- Dr. D.V.L.N. Somayajulu, Professor, Dept. of CSE, NIT Warangal.
- Dr. R. Krishnan, Professor & Head, Engineering Research, Coimbatore.
- Dr. V. Kamakshi Prasad, Professor, School of Information Technology, JNTU-H.
- Prof. P.S. Avadhani, Professor, Dept. of CS & SE, AUCOE, Vsp.
- Sri K. Sudheer Reddy, Lead – Education & Research, Campus Connect Infosys Technologies Ltd., Hyderabad.
- Ms. Malathi S., Team Lead, Academic Initiative, IBM Software Group, IBM India Pvt. Ltd.
- Sri C. Srinivas, Associate Professor & Head, Dept. of CSE, GVP College of Engg. for Women, Visakhapatnam.

- Prof.Vemuri Seshagiri Rao, Head of the department, CSE.
- Sri.G.S.Mallikharjuna Rao, Head of the department, Computer applications.

- All faculty of the department.

ACADEMIC REGULATIONS
(Effective for the students admitted into
first year from the academic year 2012-2013)

The M.Tech Degree of JNTU-KAKINADA shall be recommended to be conferred on candidates who are admitted to the program and fulfill all the requirements for the award of the Degree.

1.0 ELIGIBILITY FOR ADMISSION:

Admission to the above program shall be made subject to the eligibility, qualifications and specialization as per the guidelines prescribed by the APSCHE and AICTE from time to time.

2.0 AWARD OF M.TECH. DEGREE:

- a. A student shall be declared eligible for the award of the M.Tech. degree, if he pursues a course of study and completes it successfully for not less than two academic years and not more than four academic years.
- b. A student, who fails to fulfill all the academic requirements for the award of the Degree within four academic years from the year of his admission, shall forfeit his seat in M.Tech. Course.
- c. The duration of each semester will normally be 20 weeks with 5 days a week. A working day shall have 7 periods each of 50minutes.

3.0 COURSES OF STUDY:

M.TECH. COURSES	INTAKE
Chemical Engineering	18
Computer Science and Engineering	18
CAD/CAM	18
Infrastructural Engineering and Management	18
Structural Engineering	18
Power System Control and Automation	18
Embedded Systems & VLSI Design	18
Communications & Signal Processing	18
Software Engineering	18
Power Electronics Drives	18
Computer Aided Analysis And Design (CAAD)	18

4.0 ATTENDANCE:

The attendance shall be considered subject wise.

- a. A candidate shall be deemed to have eligibility to write end semester examinations in a subject if he has put in at least 75% of attendance in that subject.
- b. Shortage of attendance up to 10% in any subject (i.e. 65% and above and below 75%) may be condoned by a Committee on genuine and valid reasons on representation by the candidate with supporting evidence.
- c. Shortage of attendance below 65% shall in no case be condoned.
- d. A student who gets less than 65% attendance in a maximum of two subjects in any semester shall not be permitted to take the end- semester examination in which he/she falls short. His/her registration for those subjects will be treated as cancelled. The student should re-register and repeat those subjects as and when offered next.

- e.If a student gets less than 65% attendance in more than two subjects in any semester he/she shall be detained and has to repeat the entire semester.
- f.A stipulated fee shall be payable towards condonation of shortage of attendance.

5.0 EVALUATION:

- The Performance of the candidate in each semester shall be evaluated subject-wise, with 100 marks for each theory subject and 100 marks for each practical, on the basis of Internal Evaluation and End Semester Examination.
- a. A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Semester Examination and Internal Evaluation taken together.
 - b. For the theory subjects 60 marks shall be awarded based on the performance in the End Semester Examination, 40 marks shall be awarded based on the Internal Evaluation. One part of the internal evaluation shall be made based on the average of the marks secured in the two Mid–Term Examinations of 30 each conducted one in the middle of the Semester and the other immediately after the completion of instruction. Each mid-term examination shall be conducted for a duration of 120 minutes with 4 questions without any choice. The remaining 10 marks are awarded through an average of continuous evaluation of assignments / seminars / any other method, as notified by the teacher at the beginning of the semester.
 - c. For Practical subjects, 50 marks shall be awarded based on the performance in the End Semester Examinations, 50 marks

shall be awarded based on the day-to-day performance as Internal marks. A candidate has to secure a minimum of 50% in the external examination and has to secure a minimum of 50% on the aggregate to be declared successful.

- d. There shall be a seminar presentation during III semester. For seminar, a student under the supervision of a faculty member, shall collect the literature on a topic and critically review the literature and submit it to the Department in a report form and shall make an oral presentation before the Departmental Committee. The Departmental Committee consists of the Head of the Department, supervisor and two other senior faculty members of the department. For Seminar there will be only internal evaluation of 50 marks. A candidate has to secure a minimum of 50% to be declared successful.
- e. For Seminar in I, II Semesters in case of the course structure of having 5 Theory + 2 Labs. + 1 Seminar, a student has to deliver a seminar talk in each of the subjects in that semester which shall be evaluated for 10 marks each and average marks allotted shall be considered. A letter grade from A to C corresponding to the marks allotted may be awarded for the two credits so as to keep the existing structure and evaluation undisturbed.

A – Excellent	(average marks ≥ 8)
B – Good	($6 \leq$ average marks < 8)
C – Satisfactory	($5 \leq$ average marks < 6)

If a satisfactory grade is not secured, one has to repeat in the following semester.

- f. In case the candidate does not secure the minimum academic requirement in any subject (as specified in 4.0 a, c) he has to reappear for the End Examination in that subject.

A candidate shall be given one chance to re-register for each subject provided the internal marks secured by a candidate are

less than 50% and he has failed in the end examination. In such a case the candidate must re-register for the subject (s) and secure required minimum attendance. Attendance in the re-registered subject (s) has to be calculated separately to become eligible to write the end- examination in the re-registered subject(s). In the event of re-registration, the internal marks and end examination marks obtained in the previous attempt are nullified.

- g. In case the candidates secure less than the required attendance in any subject(s), he shall not be permitted to appear for the End Examination in that subject(s). He shall re-register for the subject(s) when next offered.
- h. Laboratory examination for M.Tech subjects must be conducted with two Examiners, one of them being Laboratory Class Teacher and second examiner shall be other than Laboratory Teacher.

6.0 EVALUATION OF PROJECT / DISSERTATION WORK:

Every candidate shall be required to submit the thesis or dissertation after taking up a topic approved by the Departmental Research Committee (DRC).

- a. A Departmental Research Committee (DRC) shall be constituted with the Head of the Department as the chairman and two senior faculty as members to oversee the proceedings of the project work from allotment to submission.
- b. A Central Research Committee (CRC) shall be constituted with a Senior Professor as chair person, Heads of all the Departments which are offering the M.Tech programs and two other senior faculty members.
- c. Registration of Project Work: A candidate is permitted to register for the project work after satisfying the attendance

- requirement of all the subjects (theory and practical subjects.)
- d. After satisfying 6.0 c, a candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work to the DRC for its approval. Only after obtaining the approval of DRC the student can initiate the Project work
 - e. If a candidate wishes to change his supervisor or topic of the project he can do so with approval of DRC. However, the Departmental Project Review Committee shall examine whether the change of topic/supervisor leads to a major change in his initial plans of project proposal. If so, his date of registration for the Project work shall start from the date of change of Supervisor or topic as the case may be whichever is earlier.
 - f. A candidate shall submit and present the status report in two stages at least with a gap of 3 months between them after satisfying 6.0 d.
 - g. The work on the project shall be initiated in the beginning of the second year and the duration of the project is for two semesters. A candidate shall be permitted to submit his dissertation only after successful completion of all theory and practical subject with the approval of CRC but not earlier than 40 weeks from the date of registration of the project work. For the approval by CRC the candidate shall submit the draft copy of the thesis to the Principal through the concerned Head of the Department and shall make an oral presentation before the CRC.
 - h. Three copies of the dissertation certified by the supervisor shall be submitted to the College after approval by the CRC.
 - i. The dissertation shall be adjudicated by one examiner selected by the Principal. For this HOD shall submit in consultation with the supervisor a panel of 5 examiners, who are experienced in that field.

- j. If the report of the examiner is not favorable, the candidate shall revise and resubmit the dissertation, in a time frame as prescribed by the CRC. If the report of the examiner is unfavorable again, the dissertation shall be summarily rejected then the candidate shall change the topic of the Project and option shall be given to change the supervisor also.
- k. If the report of the examiner is favorable, viva-voce examination shall be conducted by a board consisting of the supervisor, Head of the Department and the examiner who adjudicated the dissertation. The Board shall jointly report candidate's work as:
 - A. Excellent
 - B. Good
 - C. Satisfactory

7.0 AWARD OF DEGREE AND CLASS :

A candidate shall be eligible for the respective degree if he satisfies the minimum academic requirements in every subject and secures satisfactory or higher grade report on his dissertation and viva-voce.

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of M.Tech. Degree he shall be placed in one of the following three classes.

% of Marks secured	Class Awarded
70% and above	First Class with Distinction
60% and above but less than 70%	First Class
50% and above but less than 60%	Second Class

The marks in internal evaluation and end examination shall be shown separately in the marks memorandum.

The grade of the dissertation shall also be mentioned in the marks memorandum.

8.0 WITHHOLDING OF RESULTS:

If the candidate has not paid any dues to the college or if any case of indiscipline is pending against him, the result of the candidate will be withheld and he will not be allowed into the next higher semester. The recommendation for the issue of the degree shall be liable to be withheld in such cases.

9.0 TRANSITORY REGULATIONS:

A candidate who has discontinued or has been detained for want of attendance or who has failed after having studied the subject is eligible for admission to the same or equivalent subject(s) as and when subject(s) is/are offered, subject to 6.0 e and 2.0

10.0 GENERAL

1. The academic regulations should be read as a whole for purpose of any interpretation.
2. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman Academic Council is final.
3. The College may change or amend the academic regulations and syllabus at any time and the changes amendments made shall be applicable to all the students with effect from the date notified by the College.
4. Wherever the word he, him or his occur, it will also include she, hers.

COURSE STRUCTURE

I SEMESTER

COURSE CODE	THEORY/LAB	L	P	C
101T2101	Software Requirements and Estimation	4	0	4
101T2102	Advanced data structures & Algorithms	4	0	4
101T2103	Software Process and Project Management	4	0	4
101T2104	Web Technologies	4	0	4
101T2105	Distributed databases	4	0	4
101T2106	<i>Web Technologies Lab</i>	0	4	2
101T2107	<i>Advanced Data structures Lab</i>	0	4	2
101T21S1	<i>Seminar</i>	-	-	2
Total		20	8	26

II SEMESTER:

COURSE CODE	THEORY/LAB	L	P	C
101T2108	Network Security & Cryptography	4	0	4
101T2109	Data Warehousing and Mining	4	0	4
101T2110	Software Quality Assurance and Testing	4	0	4
	Elective-I	4	0	4
101T2111	Object oriented modeling			
101T2112	Image Processing and Pattern Recognition			
101T2113	Storage Area Networks and Management			
	Elective-II	4	0	4
101T2114	Neural Networks			
101T2115	Multimedia and Application Development			
101T2116	Information Retrieval Systems			
101T2117	<i>Network Security Lab</i>	0	4	2
101T2118	<i>Data warehousing & Data Mining Lab</i>	0	4	2
101T21S2	<i>Seminar</i>	-	-	2
Total		20	8	26

III SEMESTER

COURSE CODE	THEORY/LAB	L	P	C
<i>Commencement of Project Work</i>				
10IT21S3	SEMINAR	-	-	2

IV SEMESTER

COURSE CODE	THEORY/LAB	L	P	C
10IT2119	PROJECT WORK DISSERTATION / THESIS EXCELLENT/GOOD/SATISFACTORY/ NON-SATISFACTORY	-	-	56

SOFTWARE REQUIREMENTS AND ESTIMATION**Course Code: 10IT2101****L P C**
4 0 4**UNIT-I****Software Requirements: What and Why**

Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT-II**Software Requirements Engineering**

Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality.

UNIT- III**Software Requirements Management**

Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain

UNIT-IV**Software Requirements Modeling**

Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames

UNIT-V**Software Estimation**

Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation

UNIT-VI

Size Estimation

Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures.

UNIT-VII

Effort, Schedule and Cost Estimation

What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation.

UNIT-VIII

Tools for Requirements Management and Estimation

Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation.

Software Estimation Tools:

Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

Text Books

1. Rajesh Naik and Swapna Kishore: Software Requirements and Estimation, 1st edition, Tata Mc Graw Hill, 2010
2. Karl E. Weigers: Software Requirements, 2nd edition Microsoft Press, 2008

Reference Books

1. Soren Lausen: Software Requirements Styles and Techniques, 1st edition, Addison-Wesley Professional, 2009
2. Karl E. Weigers: Software Requirements Practical Techniques for gathering and managing requirements through the product development life cycle, 2nd edition, Microsoft Press, 2008

ADVANCED DATA STRUCTURES AND ALGORITHMS**Course Code: 10IT2102****L P C**
4 0 4**UNIT I****Lists, Stacks, Queues and Trees**

Lists, Stacks and Queues: Abstract Data Types (ADTs), The List ADT, Vector and list in the STI, Implementation of vector, Implementation of list, The Stack ADT, The Queue ADT. Trees: The Search Tree ADT – Binary Search Trees, AVL Trees, Splay Trees, B-Trees

UNIT II**Hashing and Priority Queues**

Hashing: General idea, Hash Function, Separate Chaining, Hash Tables Without Linked Lists, Rehashing, Extendible Hashing, Priority Queues: Implementations, Binary Heap, Applications of Priority Queues, d -Heaps, Leftist Heaps, Skew Heaps, Binomial Queues.

UNIT III**Sorting**

Sorting: A Lower Bound for Simple sorting Algorithms, Shellsort, Heapsort, Mergesort, Quicksort, Indirect Sorting, A General Lower Bound for sorting, Bucket Sort, External Sorting.

UNIT IV**The Disjoint Set Class**

Equivalence Relations, The Dynamic Equivalence Problem, Basic Data Structure, Smart Union Algorithms, Path Compression, Worst Case of Union-by-Rank and Path Compression, An Application.

UNIT V**Graph Algorithms**

Definitions, Topological sort, Shortest-Path Algorithms, Network Flow Problems, Minimum Spanning Tree, Applications of Depth-First Search,

introduction to NP-Completeness.

UNIT VI

Algorithm Design Techniques

Greedy Algorithms, Divide and Conquer, Dynamic Programming, Randomized Algorithms, Backtracking Algorithms.

UNIT VII

Amortized Analysis

An Unrelated Puzzle, Binomial Queues, Skew Heaps, Fibonacci Heaps, Splay Trees

UNIT VIII

Advanced Data Structures and Implementation

Top-Down Splay Trees, Red-Black Trees, Deterministic Skip lists, AA-Trees, Treaps, k -d Trees, Pairing Heaps

Text Books:

1. Mark Allen Weiss: Data Structures and Algorithm Analysis in c++, 2nd edition, Pearson Education, 2010.

Reference Books:

1. Sartaj Sahni: Data Structures Algorithms and Applications in c++, 2nd edition, Universities Press, 2009.
2. Ellis Horowitz, Sartaj Sahni, Rajasekharan, Sangyathervar: Fundamentals of Algorithms, 2nd edition, Universities Press, 2009.
3. Aho V Alfred Hopcroft E John Ullman D Jeffrey: Data Structures and Algorithms, 7th edition, Pearson Education, 2007.
4. Adam Drozdek, Thomson: Data Structures and Algorithms in Java, 2nd edition, Pearson Education, 2007.
5. Horowitz, Sahni, Mehta: Fundamentals of Data Structures in C++, 2nd edition, University Press, 2007

SOFTWARE PROCESS AND PROJECT MANAGEMENT**Course Code: 10IT2103****L P C
4 0 4****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.

UNIT-II**Process Reference Models**

Capability Maturity Model (CMM), CMMi, PCMM, PSP, TSP, IDEAL, Process Definition Techniques.

UNIT-III**Software Project Management Renaissance**

Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.

UNIT-IV**Managing Software Projects**

Project Management and the CMM, Project Management and CMMi, Project Management Process Framework.

UNIT-V**Project Planning**

Software Life Cycle Models, Project Organizations and Responsibilities, Artifacts of the Project Management Process, Cost and Scheduling estimation, Establishing Project Environment, Risk Management, Quality Assurance and Configuration Management

UNIT- VI

Project Tracking and Control

Defect Tracking, Issue Tracking, Status Reports, Milestone Analysis, Defect Analysis and Prevention Methods, Process monitoring and audit, Reviews, Inspections and Walkthroughs, Seven Core Metrics, Management indicators, Quality Indicators

UNIT- VII

Project Closure

Project Closure Analysis, Role of Closure Analysis in a project, Performing Closure Analysis, Closure Analysis Report

UNIT- VIII

CCPDS-R Case Study and Future Software Project Management Practices

Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions

Text Books

1. Watts S. Humphrey: Managing the Software Process, 1st edition, Pearson Education, 2009
2. Walker Royce: Software Project Management, 1st edition, Pearson Education, 2009

Reference Books

1. Watts S. Humphrey: An Introduction to the Team Software Process, 1st edition, Pearson Education, 2009.
2. Watts S. Humphrey: A Discipline to Software Engineering, 1st edition, Pearson Education, 2009.
3. Pankaj Jalote: Software Project Management in Practice, 1st edition, Pearson Education, 2009

WEB TECHNOLOGIES

Course Code: 10IT2104

L P C
4 0 4

UNIT-I

HTML Common tags- List, Tables, images, forms, Frames, Cascading Style sheets.

UNIT-II

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT-III

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT-IV

Java Beans: Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT-V

Web Servers: Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

UNIT-VI

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting

and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

UNIT-VII

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

UNIT-VIII

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, Introduction to struts framework..

Text Books :

1. Chris Bates : Web Programming: Building Internet Applications, 2nd Edition, Wiley Dream Tech, 2002 .
2. Patrick Naughton and Herbert Schildt: The Complete Reference Java 2, 5th edition , TMH, 2002
3. Hans Bergsten : Java Server Pages, 3rd Edition , SPD Oreilly, 2003

References :

1. Dietel and Nieto : Internet and World Wide Web, 2nd Edition, PHI/Pearson Education Asia, 2001.
2. Bill Siggelkow: Jakarta Struts Cookbook, 1st Edition, SPD Oreill, 2005.
3. Murach's, Doug Lowe, Andrea Steel Man : Murarch's beginning JAVA JDK 5, 1st Edition , SPD, 2005.
4. Pauls, Wang and Sand Katila: An Introduction to Web Design and Programming, 1st Edition, Thomson, 2003.

5. Knuckles, John Wiley : Web Applications Technologies Concepts ,1st Edition Wiley India Pvt. Ltd,2005.
6. Robert W. Sebesta: Programming World Wide Web, 1st edition , Pearson,2008.
7. NIIT : Building Web Applications 1st Edition,PHI,2005
8. Zak, Dianel bai,Xue : Web Warrior Guide to Web Programming, 1st Edition,Thomas, 2003.
9. Jon Duckett: Beginning Web Programming,1st Edition, WROX, Publication ,2004.
10. Pekowsky : Java Server Pages, 2nd Edition, Pearson, Education 2008.

DISTRIBUTED DATABASES**Course Code: 10IT2105****L P C**
4 0 4**UNIT - I**

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

UNIT – II

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT – III

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

UNIT – IV

The Management of Distributed Transactions, A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT - V

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT – VI

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of

the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT - VII

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNIT - VIII

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

Text Books:

1. Stefano Ceri, Giuseppe Pelagatti : Distributed Database Principles & Systems, 3rd Edition , Tata McGraw Hill, 2009.

Reference Books:

1. M.Tamer Ozsu, Patrick Valduriez : Principles of Distributed Database Systems, 2nd Edition, Pearson Education, 2007.

WEB TECHNOLOGIES LAB**Course Code: 10IT2106****L P C**
- 4 2

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

ADVANCED DATA STRUCTURES LAB**Course Code: 10IT2107****L P C**
- 4 2**Implement the following using C/C++/Java**

- 1) Write a program to perform the following operations on singly linked list.
 - i) Creation ii) Insertion iii) Deletion iv) Traversal.
- 2) Write a program to perform the following operations on doubly linked list.
 - i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
- 3) Write a program that implements stack (its operations) using
 - i) Arrays ii) linked list
- 4) Write a programs that implements Queue (its operations) using
 - i) Arrays ii) linked list
- 5) Write C program that implements the Quick sort method to sort a given list of integers in ascending order.
- 6) Write C program that implement the Merge sort method to sort a given list of integers in ascending order.
- 7) Write C program that implement the SHELL sort method to sort a given list of integers in ascending order.

- 8) Write a program to perform the following:
 - i) Creating a Binary Tree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.

- 9) Write a C program to perform the following:
 - i) Creating a AVL Tree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.

- 10) Write a C program that uses functions to perform the following:
 - i) Creating a SplayTree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.

- 11) Write a C program to perform the following:
 - i) Creating a B-Tree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.

- 12) Write a program that implements Kruskal's algorithm using a disjoint set data structure. The program takes as input a file (data.txt), in which each line either represents a vertex or an edge. For the edge lines, the first integer on that line representing the starting vertex, the second the ending vertex, and the third the weight of the edge. Use this file to construct, line by line, the graph upon which Kruskal's algorithm will be run (do NOT hardcode this graph!).

- 13) Write a program to simulate various graph traversing algorithms.

- 14) write a program to find the minimal spanning tree of a graph using the Prim's algorithm. The program should be able to read in the weight matrix of a graph and produce the minimal spanning tree. Generate weight matrices (using a random number generator) with

a large number of nodes and estimate the time complexity of the algorithm.

- 15) Write a program to find the closest pair of points using a divide and conquer strategy. Use the random number generator to generate a large number of points in a unit square as input to the algorithm. Test the correctness of the algorithm by using a brute force method.
- 16) Use dynamic programming to find the optimal binary search tree for a given set of numbers together with their probabilities. Remember that the numbers may be generated in any order, so, a presorting step is also required.

NETWORK SECURITY AND CRYPTOGRAPHY**Course Code: 10IT2108****L P C**
4 0 4**UNIT-I**

Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security. Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

UNIT-II

Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations. Algorithms: Triple DES, International Data Encryption algorithm, Blowfish, RC5, CAST-128, RC2, Characteristics of Advanced Symmetric block ciphers.

UNIT-III

Conventional Encryption: Placement of Encryption function, Traffic confidentiality, Key distribution, Random Number Generation. Public Key Cryptography: Principles, RSA Algorithm, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptography.

UNIT-IV

Number theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms. Message authentication and Hash functions: Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash function and MACs.

UNIT-V

Hash and Mac Algorithms: MD File, Message digest Algorithm, Secure Hash Algorithm, RIPEMD-160, HMAC. Digital signatures and Authentication protocols: Digital signatures, Authentication Protocols, Digital signature standards.

UNIT-VI

Authentication Applications: Kerberos, X.509 directory Authentication service. Electronic Mail Security: Pretty Good Privacy, S/MIME.

UNIT-VII

IP Security: Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management. Web Security: Web Security requirements, Secure sockets layer and Transport layer security, Secure Electronic Transaction.

UNIT-VIII

Intruders, Viruses and Worms: Intruders, Viruses and Related threats. Fire Walls: Fire wall Design Principles, Trusted systems.

Text Books:

1. William Stallings: Cryptography and Network Security: Principles and Practice, 3rd edition, Pearson Education, 2008
2. William Stallings: Network Security Essentials (Applications and Standards), 2nd edition, Pearson Education, 2009

Reference Books:

1. Eric Maiwald: Fundamentals of Network Security, 1st edition, Dreamtech press, 2008
2. Charlie Kaufman, Radia Perlman and Mike Speciner: Network Security - Private Communication in a Public World, 2nd edition, Pearson Education, 2009
3. Michael E. Whitman and Herbert: Principles of Information Security, 2nd edition, Thomson publication, 2009

4. Robert Bragg, Mark Rhodes: Network Security-The complete reference, 1st edition, Tata McGraw Hill, 2008
5. Buchmann: Introduction to Cryptography, Springer International edition, 2009

DATA WAREHOUSING AND MINING

Course Code: 10IT2109

L P C
4 0 4

UNIT- I

Introduction: Data mining-On what kinds of Data, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in Data Mining.

UNIT-II

Data Preprocessing: Descriptive data summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT-III

Data Warehouse and OLAP Technology: Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehousing to Data Mining.

UNIT-IV

Data Cube Computation and Data Generalization: Efficient methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.

UNIT-V

Mining Frequent Patterns, Association and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint Based Association.

UNIT- VI

Classification and Prediction-1: Issues Regarding Classification and

Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation.

UNIT- VII

Classification and Prediction-2: Support Vector Machines, Association Classification, Other Classification Methods, Prediction, Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor.

UNIT- VIII

Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

Text Books:

1. Jiawei Han & Micheline Kamber : Data Mining – Concepts and Techniques, 2nd Edition, Morgan Kaufmann Publishers, 2008.
2. Margaret H Dunham : Data Mining Introductory and Advanced Topics, 6th Edition, Pearson education, 2009.

Reference Books:

1. Arun K Pujari : Data Mining Techniques, 1st Edition, University Press, 2005.
2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar : Introduction To Data Mining, 1st Edition, Pearson Education, 2009.
3. Sam Aanhory & Dennis Murray : Data Warehousing in the Real World, 1st Edition, Pearson Education, 2008.
4. Paulraj Ponnaiah : Data Warehousing Fundamentals, 1st Edition, Wiley student Edition, 2007.
5. Ralph Kimball : The Data Warehouse Life cycle Tool kit, 2nd Edition, Wiley student Edition, 2005.

SOFTWARE QUALITY ASSURANCE AND TESTING

Course Code: 10IT2110

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4	0	4

UNIT - I

Software quality assurance Framework and Standards

SQA Frame work: What is Quality? Software Quality Assurance. Components of Software quality Assurance.

Software Quality Assurance Plan : Steps to develop and implement a Software quality Assurance Plan.

Standards: ISO9000, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma

UNIT II

Software Quality Assurance Metrics and Measurement

Software Quality Assurance Metrics: Product Quality metrics, In-Process Quality metrics, Metrics for Software Maintenance. Examples of Metric Programs

Software quality indicators

Fundamentals in Measurement Theory

UNIT III

Building Software Testing Environment : Writing Policy for software testing, Economics of testing, Bulding a structured approach to software testing .

Software Testing process: Defects Hard to find, Functional and structured testing, Workbench concept, Customising the software testing process, testing tactics check list

UNIT IV

Software Testing Techniques

Black-Box testing, Boundary value analysis, Bottom-up, Branch Coverage, Cause- Effect graphing, CRUD, Database, exception,

Gray_box, Histogram, Inspections, JADs, Pareto Analysis, Prototyping, random Testing, Risk based Testing, Regression Testing, Structured Walkthrough, Thread testing, Performance Testing, White-Box Testing

UNIT V

Software Testing Tools

Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Load Runner, Win Runner and Rational Testing Tools, Java testing Tools, JMetra, JUNIT and Cactus

UNIT VI

Testing Process PART I

Advantages of following a process, Cost of computer testing, Seven step software Testing Process, Define the scope of testing, Developing the test plan, Verification Testing.

UNIT VII

Testing Process PART II

Validation Testing, Analysing and reporting test results, Acceptance and operational Testing, Post Implementation Analysis

UNIT VIII

Testing Specialised Systems and Applications

Testing Client/Server System, Testing COTS and Contracted Software, Testing security, Testing Data Warehouse .

Text Books:

1. William E.Perry:Effective Methods for Software Testing, 3rd Edition,Wiley Publication,2009.
2. Mordechai Ben-Menachem,Garry S. Marliss:Software Quality,1st Edition, Thomson Learning Publication,2008

OBJECT ORIENTED MODELLING

Course Code: 10IT2111

L P C
4 0 4

UNIT- I

Introduction to UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.

UNIT-II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT-III

Collaboration Diagrams: Terms, Concepts, depicting a message, iterated messages, use of self in messages.

Sequence Diagrams: Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.

Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams.

UNIT-IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT-V

The Unified process: use case driven, architecture centric, iterative, and incremental

The Four Ps: people, project, product, and process

Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases

Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

UNIT-VI

Iterative incremental process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.

The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases

Inception phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

UNIT-VII

Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows-Requirements to test.

Construction phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.

Transition phase: early in the transition phase, activities in transition phase

UNIT-VIII

Case Studies: Automation of a Library, Software Simulator application (2-floor elevator simulator)

Text Books:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, 2nd edition, Pearson Education, 2008
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY, 2nd edition, dreamtech India Pvt. Ltd, 2005
3. Ivar Jacobson, Grady Booch, James Rumbaugh: The Unified Software Development Process, 3rd edition, Pearson Education, 2006

Reference Books

1. Meilir Page-Jones : Fundamentals of Object Oriented Design in UML, 1st edition, Pearson Education, 2000
2. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies. Mark Priestley: Practical Object-Oriented Design with UML, 1st edition, TATA McGrawHill, 2001

IMAGE PROCESSING AND PATTERN RECOGNITION

Course Code: 10IT2112

L P C
4 0 4

UNIT-I

The digitized image and its properties: Applications of image processing, image function, image representation, sampling, quantization, color images, metrics and topological properties of digital images, histograms, image quality, noise image.

UNIT-II

Image preprocessing: Pixel brightness transformation, position dependent brightness correction, gray scale transformation, geometric transformation, local preprocessing- image smoothening.

UNIT-III

Edge detectors, zero-crossing, scale in image processing, canny edge detection, parametric edge models, edges in multi spectral images, local preprocessing and adaptive neighborhood pre processing, image restoration.

UNIT-IV

Image Segmentation-Threshold detection methods, optimal thresholding, multispectral thresholding, thresholding in hierarchical data structures; edge based image segmentation-edge image thresholding, edge relaxation, border tracing, border detection.

UNIT-V

Mathematical Morphology-Basic morphological concepts, four morphological principles, binary dilation, erosion, Hit or miss transformation, opening and closing; thinning and skeleton algorithms; Morphological segmentation -particles segmentation and watersheds, particles segmentation.

UNIT- VI

Image textures-statistical texture description, methods based on spatial frequencies, co-occurrence matrices, edge frequency, and texture recognition method applications.

UNIT- VII

Image representation and description-representation, boundary descriptors, regional descriptors .

UNIT- VIII

Pattern recognition fundamentals: Basic concepts of pattern recognition, fundamental problems in pattern recognition system, design concepts and methodologies, example of automatic pattern recognition systems, a simple automatic pattern recognition model.

Text Books

1. Millan sonka, Vaclav Hiavac, roger Boyle:Image Processing Analysis and Machine Vision, 2nd Edition,vikas publishing House, 2008
2. Rafel C. Gonzalez Richard E. Woods:Digital Image Processing,2nd edition,Pearson Education, 2008
3. Julius T. Tou and Rafel C. Gonzalez, Addison:Pattern Recognition principles,2nd edition,Wesley publishing company, 1981
4. Earl Gose, Richard Johnsonbaugh :Pattern Recognition and Image Analysis,2nd edition, prentice Hall of India private limited,1999.

STORAGE AREA NETWORKS AND MANAGEMENT

Course Code: 10IT2113

L P C
4 0 4

UNIT-I

Introduction to Storage Technology Information storage, evolution of storage technology and architecture, data center infrastructure, key challenges in Managing information, information lifecycle.

Storage system Environments: components of storage system environment, Disk Drive components, Disk Drive Performance, fundamental laws governing disk performance, logical components of the host, application requirements and disk performance.

UNIT-II

Data Protection: RAID: Implementation of RAID, RAID array components, RAID levels, RAID comparison, RAID Impact on disk performance, host spares. Intelligent Storage System: Components of an Intelligent Storage System, Intelligent Storage array, concepts in Practice: EMC CLARiiON and Symmetrix.

UNIT -III

Direct – Attached Storage and Introduction to SCSI :Types of DAS, DAS benefits and limitations, disk drive interfaces, introduction to parallel SCSI, SCSI command model.

Storage Area Networks: fibre channel, The SAN and Its evolution, components of SAN, FC connectivity, Fibre channel ports, fibre channel architecture, zoning, fiber channel login types, concepts in practice: EMC Connectrix.

UNIT-IV

Network attached storage: general purpose servers vs NAS Devices, benefits of NAS, NAS file I/O, components of NAS, NAS Implementations, NAS file sharing protocols, NAS I/O operations, factors effecting NAS Performance and availability, concepts in

practice: EMC Celerra.IP SAN: iscsi, fcip.

UNIT -V

Content – addressed storage: Fixed content and Archives, types of archives, features and benefits of CAS, CAS Architecture, object storage and retrieval in CAS, CAS Examples, concepts in practice: EMC Centera. Storage Virtualization: Forms of Virtualization, SNIA Storage virtualization taxonomy, storage virtualization configurations, storage virtualization challenges, types of storage virtualization, concepts in practice: EMC Invista, Rainfinity.

UNIT-VI

Introduction to business continuity: information availability, BC terminology, BC planning life cycle, Failure analysis, business impact analysis, BC technology solutions, concepts in practice: EMC Power path. Backup and recovery: backup purpose, backup considerations, backup granularity, recovery considerations, backup methods, backup process, backup and restore operations , backup topologies, backup in NAS environments, backup technologies, concepts in practice: EMC Networker, EMC Disk Library(EDL).

UNIT-VII

Local replication: Source and targets, uses of local replicas, data consistency, local replication technologies, restore and restart considerations, creating multiple replicas, management interface, concepts in practice EMC Timefinder and Emc snap view. Remote replication: modes of remote replication, remote replication technologies, network infrastructure, concepts in practice: EMC SRDF,EMC SAN Copy.

UNIT-VIII

Securing the infrastructure: storage security framework, storage security domains, security implementations in storage networking.

Managing the Storage infrastructure: Monitoring the Storage infrastructure, Storage management activities, Storage infrastructure management challenges, developing an ideal solution, concepts in

practice: EMC control center.

Text books:

1. G. Somasundaram, A. Shrivastava:EMC Corporation, Information Storage and Management,1st edition, Wiley Publication,2009
2. Robert Spalding: Storage Networks: The Complete Reference,1st edition, Tata McGraw Hill/Osborne, 2003.

References:

1. Marc Farley:Building Storage Networks,2nd edition, Tata McGraw Hill/Osborne , 2001
2. Meeta Gupta: Storage Area Network Fundamentals,1st edition, Pearson Education , 2002.

NEURAL NETWORKS

Course Code: 10IT2114

L P C
4 0 4

UNIT-I

Introduction - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

UNIT-II

Learning Process – Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

UNIT-III

Single layer perceptrons – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment

UNIT- IV

Multilayer Perceptron – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection.

UNIT- V

Back Propagation - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques,

Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT- VI

Self Organization Maps – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive pattern classification .

UNIT- VII

Neuro Dynamics – Dynamical systems, stability of equilibrium states, attractors, neurodynamical models , manipulation of attractors as a recurrent network paradigm.

UNIT- VIII

Hopfield Models – Hopfield models, computer experiment

Text Books:

1. Simon Haykin: Neural Networks A comprehensive foundations, 2nd edition, Pearson Education ,2004.

Reference Books:

- 1.B.Yegnarayana:Artificial Neural Networks, 2ndedition,Prentice Hall of India Pvt. Ltd, 2005.
- 2.Li Min Fu: Neural Networks in Computer Intelligence, 5th edition, TMH, 2003.
- 3.James A Freeman David M S Kapura:Neural Networks ,1st edition Pearson Education , 2011.

MULTIMEDIA AND APPLICATION DEVELOPMENT**Course Code: 10IT2115****L P C**
4 0 4**UNIT- I**

Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT- II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT- III

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class

UNIT- IV

Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions

UNIT- V

Application Development:An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

UNIT- VI

Multimedia data compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT- VII

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT- VIII

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

Text Books:

1. Ze-Nian Li and Mark S.Drew: Fundamentals of Multimedia, 1st Edition, PHI/Pearson Education, 2004.
2. Colin Moock: Essential ActionScript 2.0, 1st Edition, SPD O, REILLY, 2004

References:

1. Nigel Chapman and Jenny Chapman : Digital Multimedia , 3rd Edition, Wiley Dreamtech, 2009
2. David Vogeeler, Mathew Pizzi : Macromedia Flash Mx Professional, 1st Edition, Publication 2004.
3. Steve Heath: Multimedia and communications technology, 2nd Edition, Elsevier(Focal Press), 1999.
4. Steinmetz, Ralf, Nahrstedt : Multimedia Applications, 1st Edition, Springer, 2004
5. Weixel: Multimedia Basics, 2nd Edition, Thomson Press, 2006.

INFORMATION RETRIEVAL SYSTEMS

Course Code: 10IT2116

L P C
4 0 4

UNIT- I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT- II

Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT- III

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

UNIT- IV

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT- V

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

UNIT- VI

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT- VII

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of

information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT- VIII

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

Text Books:

- 1.Kowalski,Gerald,Mark T Maybury: Information Retrieval Systems:Theory and Implementation,2nd edition ,Kluwer Academic Press,Springer Publication,2009.

Reference Books:

- 1.Frakes,W.B.Ricardo Baeza-Yates:Information Retrieval Data Structures and Algorithms,1st edition,Pearson Education,2009.
- 2.Yates, Ricardo Baeza:Modern Information Retrieval,1st edition, Pearson Education,2009.
- 3.Robert Korfhage:Information Storage & Retrieval ,1st edition,John Wiley & Sons,2009.

NETWORK SECURITY LAB**Course Code: 10IT2117****L P C**
- 4 2

1. Working with Sniffers for monitoring network communication (Ethereal)
2. Understanding of cryptographic algorithms and implementation of the same in C or C++
3. Using openssl for web server – browser communication.
4. Using GNU PGP create and exchange public key and private key
5. Performance evaluation of various cryptographic algorithms
6. Using IPTABLES on Linux and setting the filtering rules.
7. Configuring S/MIME for e-mail communication.
8. Understanding the buffer overflow and format string attacks
9. Using NMAP for ports monitoring.
10. Implementation of proxy based security protocols in C or C++ with features like confidentiality, integrity and authentication

Following are some of the web links, which help to solve the above assignments:

- http://linuxcommand.org/man_pages/openssl.html
- <http://www.openssl.org/docs/apps/openssl.html>
- <http://www.qaueen.clara.net/pgp/art3.html>
- <http://www.ccs.ornl.gov/-hongo/main/resources/contrib/gpg-howto/gpg-howto.html>
- <https://netfiles.uiuc.edu/ehowes/www/gpg/gpg-com-0.htm>
- <http://www.ethereal.com/docs/user-guide>

DATA WAREHOUSING AND DATA MINING LAB**Course Code: 10IT2118****L P C**
- 4 2

1. Implementation of multi dimensional data model using oracle warehouse builder/SQL Server.
2. Introduction to Weka : All the features of Weka software will be explored in this assignment.

Implementation of the following programs in C/C++.

3. Implementation of Apriori algorithm
4. Implementation of FP tree algorithm
5. Implementation of Naïve Bayesian classification algorithm
6. Implementation of Backpropagation algorithm
7. Implementation of K-means clustering algorithm
8. Implementation of K-Medoids clustering algorithm
