VELTECH MULTI TECH Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

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Approved by AICTE, New Delhi NBA Accredited & Affiliated to Anna University Chennai-25

SYLLABUS
WEEKLY SCHEDULE

SEMESTER II **2014- 2015**

I YEAR ME COMPUTER SCIENCE AND ENGINEERING

II YEAR COURSE

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WEEKLY SCHEDULE

SL.NO.	WEEK	FROM	TO
1	**WEEK1**	07.01.15	09.01.15
2	**WEEK2**	12.01.15	16.01.15
3	**WEEK3**	19.01.15	23.01.15
4	**WEEK4**	27.01.15	30.01.15
5	**WEEK5**	02.02.15	06.02.15
6	**WEEK6**	09.02.15	13.02.15
7	**WEEK7**	16.02.15	20.02.15
8	**WEEK8**	23.02.15	27.02.15
9	**WEEK9**	02.03.15	06.03.15
10	**WEEK10**	09.03.15	13.03.15
11	**WEEK11**	16.03.15	20.03.15
12	**WEEK12**	23.03.15	27.03.15
13	**WEEK13**	30.03.15	01.04.15
14	**WEEK14**	06.04.15	10.04.15
15	**WEEK15**	13.04.15	17.04.15
16	**WEEK16**	20.04.15	24.04.15
17	**WEEK17**	27.04.15	30.04.15

CONTENTS

TEST SCHEDULE

UNIT TEST –I

Sl. NO	DATE	SUB.CODE	SUBJECT
1.	27.01.15 FN	CP7201	THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE
2.	27.01.15 AN	CP7202	ADVANCED DATABASES
3.	28.01.15 FN	CP7203	PRINCIPLES OF PROGRAMMING LANGUAGES
4.	28.01.15 AN	CP7204	ADVANCED OPERATING SYSTEMS
5.	29.01.15 FN	NE7202	NETWORK AND INFORMATION SECURITY
6.	29.01.15 AN	IF7202	CLOUD COMPUTING

UNIT TEST –II

Sl. NO	DATE	SUB.CODE	SUBJECT
1.	16.02.15 FN	**CP7201**	**THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE**
2.	16.02.15 AN	**CP7202**	**ADVANCED DATABASES**
3.	17.02.15 FN	**CP7203**	**PRINCIPLES OF PROGRAMMING LANGUAGES**
4.	17.02.15 AN	**CP7204**	**ADVANCED OPERATING SYSTEMS**
5.	18.02.15 FN	**NE7202**	**NETWORK AND INFORMATION SECURITY**
6.	18.02.15 AN	**IF7202**	**CLOUD COMPUTING**

UNIT TEST –III

Sl. NO	DATE	SUB.CODE	SUBJECT
1	06.03.15 FN	**CP7201**	**THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE**
2.	06.03.15 AN	**CP7202**	**ADVANCED DATABASES**
3.	07.03.15 FN	**CP7203**	**PRINCIPLES OF PROGRAMMING LANGUAGES**
4.	07.03.15 AN	**CP7204**	**ADVANCED OPERATING SYSTEMS**
5.	08.03.15 FN	**NE7202**	**NETWORK AND INFORMATION SECURITY**
6.	08.03.15 AN	**IF7202**	**CLOUD COMPUTING**

UNIT TEST –IV

Sl. NO	DATE	SUB.CODE	SUBJECT
1	26.03.15 FN	**CP7201**	**THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE**
2.	26.03.15 AN	**CP7202**	**ADVANCED DATABASES**
3.	27.03.15 FN	**CP7203**	**PRINCIPLES OF PROGRAMMING LANGUAGES**
4.	27.03.15 AN	**CP7204**	**ADVANCED OPERATING SYSTEMS**
5.	28.03.15 FN	**NE7202**	**NETWORK AND INFORMATION SECURITY**
6.	28.03.15 AN	**IF7202**	**CLOUD COMPUTING**

UNIT TEST –V

Sl. NO	DATE	SUB.CODE	SUBJECT
1	20.04.15 FN	**CP7201**	**THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE**
2.	20.04.15 AN	**CP7202**	**ADVANCED DATABASES**
3.	21.04.15 FN	**CP7203**	**PRINCIPLES OF PROGRAMMING LANGUAGES**
4.	21.04.15 AN	**CP7204**	**ADVANCED OPERATING SYSTEMS**
5.	22.04.15 FN	**NE7202**	**NETWORK AND INFORMATION SECURITY**
6.	22.04.15 AN	**IF7202**	**CLOUD COMPUTING**

MODEL EXAM

Sl. NO	DATE	SUB.CODE	SUBJECT
1	23.04.2015	CP7201	THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE
2.	24.04.2015	CP7202	ADVANCED DATABASES
3.	27.04.2015	CP7203	PRINCIPLES OF PROGRAMMING LANGUAGES
4.	28.04.2015	CP7204	ADVANCED OPERATING SYSTEMS
5.	29.04.2015	NE7202	NETWORK AND INFORMATION SECURITY
6.	30.04.2015	IF7202	CLOUD COMPUTING

CP7201 THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE

UNIT I- FOUNDATIONS

WEEK-1 Sets –relations –equivalence relations –partial orders –functions- recursive functions sequences induction principle –structural induction –recursive algorithms –counting pigeonhole principle –permutations and combinations –recurrence relations

WEEK -2 UNIT TEST -1

UNIT II - LOGIC AND LOGIC PROGRAMMING

WEEK-3 Propositional logic – syntax – interpretations and models – deduction theorems – normal forms – inference rules – SAT solvers - predicate logic – syntax – proof theory – semantics of predicate logic

WEEK-4 un decidability of predicate logic – inferences in first-order logic – logic programming – definite programs

WEEK-5 SLD resolution – normal programs – SLDNF resolution –introduction to Prolog

WEEK-6 UNIT TEST - II

UNIT – III - LAMBDA CALCULUS AND FUNCTIONAL PROGRAMMING

WEEK-7 Lambda notation for functions – syntax – curried functions – parametric polymorphism lambda reduction – alpha reduction – beta reduction – beta abstraction – extensionality theorem

WEEK -8 delta reduction – reduction strategies – normal forms – Church-Rosser Theorems – pure lambda calculus – constants – arithmetic – conditionals – Iteration – recursion – introduction to functional programming

WEEK -9 UNIT TEST -III

UNIT – IV GRAPH STRUCTURES

WEEK-10 Tree Structures – Graph structures – graph representations – regular graph structures – random graphs – Connectivity – Cycles Graph Coloring – Cliques, Vertex Covers, Independent sets

WEEK-11 Spanning Trees – network flows – matching

WEEK-12 UNIT **TEST – IV**

UNIT – V STATE MACHINES

WEEK-13 Languages and Grammars – Finite State Machines – State machines and languages – Turing Machines
WEEK-14 Computational Complexity – computability – Decidability – Church's Thesis

WEEK-15 UNIT TEST – V

WEEK-16,17 MODEL EXAM

REFERENCES:

1. Uwe Schoning, "Logic for Computer Scientists", Birkhauser, 2008.
2. M. Ben-Ari, "Mathematical logic for computer science", Second Edition, Springer, 2003.
3. John Harrison, "Handbook of Practical Logic and Automated Reasoning", Cambridge University Press, 2009.
4. Greg Michaelson, "An introduction to functional programming through lambda calculus", Dover Publications, 2011.
5. Kenneth Slonneger and Barry Kurtz, "Formal syntax and semantics of programming languages", Addison Wesley, 1995.
6. Kenneth H. Rosen, "Discrete Mathematics and its applications", Seventh Edition, Tata McGraw Hill, 2011.
7. Sriram Pemmaraju and Steven Skiena, "Computational Discrete Mathematics", Cambridge University Press, 2003.
8. M. Huth and M. Ryan, "Logic in Computer Science – Modeling and Reasoning about systems", Second Edition, Cambridge University Press, 2004.
9. Norman L. Biggs, "Discrete Mathematics", Second Edition, Oxford University Press, 2002.
10. Juraj Hromkovic, "Theoretical Computer Science", Springer, 1998.
11. J. E. Hopcroft, Rajeev Motwani, and J. D. Ullman, "Introduction to Automata Theory,
Languages, and Computation", Third Edition, Pearson, 2008

CP7202 ADVANCED DATABASES

UNIT I PARALLEL AND DISTRIBUTED DATABASES

WEEK 1: Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query ParallelismInter and Intra operation Parallelism –

Design of Parallel Systems- Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Case Studies

.

WEEK -2 UNIT TEST 2
UNIT II - OBJECT AND OBJECT RELATIONAL DATABASES

WEEK-3 Concepts for Object Databases: Object Identity – Object structure – Type Constructors –Encapsulation of Operations – Methods
WEEK-4 – Persistence – Type and Class Hierarchies –Inheritance – Complex Objects – Object Database Standards
WEEK-5 Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems: Object Relational features in SQL/Oracle – Case Studies

WEEK-6 UNIT TEST - II

UNIT – III INTELLIGENT DATABASES

WEEK-7 Active Databases: Syntax and Semantics (Starburst, Oracle, DB2)- Taxonomy-Applications-Design Principles for Active Rules- Temporal Databases: Overview of Temporal Databases-TSQL2- Deductive Databases: Logic of Query Languages – Datalog- Recursive Rules
WEEK-8 Syntax and Semantics of Datalog Languages- Implementation of Rules and Recursion-Recursive Queries in SQL- Spatial Databases- Spatial Data Types- Spatial Relationships-Spatial Data Structures-Spatial Access Methods- Spatial DB Implementation

WEEK -9 UNIT TEST - III
UNIT – IV ADVANCED DATA MODELS

WEEK-10 Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols-
WEEK-11 Multimedia Databases- Information Retrieval- Data Warehousing- Data Mining-Text Mining.

WEEK-12 UNIT TEST - IV

UNIT – V EMERGING TECHNOLOGIES

WEEK-13 XML Databases: XML-Related Technologies-XML Schema- XML Query Languages- Storing XML in Databases-XML and SQL- Native XML Databases- Web Databases- Geographic Information Systems- Biological Data Management-
WEEK-14 Cloud Based Databases: Data Storage Systems on the Cloud- Cloud Storage Architectures-Cloud Data Models- Query Languages-Introduction to Big Data-Storage-Analysis.

WEEK-15 UNIT TEST – V
WEEK-16,17 MODEL EXAM

REFERENCES:

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education/Addison Wesley, 2007.
2. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.
3. Henry F Korth, Abraham Silberschatz, S. Sudharshan, "Database System Concepts",

Fifth Edition, McGraw Hill, 2006.
4. C.J.Date, A.Kannan and S.Swamynathan, ”An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.
5. Raghu Ramakrishnan, Johannes Gehrke, “Database Management Systems”, McGraw Hill, Third Edition 2004.

CP7203 PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT I - UNIT I SYNTAX AND SEMANTICS 9

WEEK-1 Evolution of programming languages – describing syntax – context-free grammars – attributes grammars describing semantics – lexical analysis – parsing — recursive-decent – bottom up parsing
WEEK -2 UNIT TEST -1

UNIT II - DATA, DATA TYPES, AND BASIC STATEMENTS 9
WEEK-3 Names – variables – binding – type checking – scope – scope rules – lifetime and garbage collection – primitive data types – strings – array types – associative arrays
WEEK-4 record types –union types – pointers and references – Arithmetic expressions – overloaded operators –type conversions – relational and boolean expressions
WEEK-5 assignment statements – mixed mode assignments – control structures – selection iterations – branching – guarded statements

WEEK-6 UNIT TEST - II

UNIT – III - SUBPROGRAMS AND IMPLEMENTATIONS 9

WEEK-7 Subprograms – design issues – local referencing – parameter passing – overloaded methods – generic methods – design issues for functions – semantics of call and return –
WEEK-8 implementing simple subprograms – stack and dynamic local variables – nested Subprograms – blocks – dynamic scoping

WEEK – 9 UNIT TEST - III
UNIT – IV OBJECT-ORIENTATION, CONCURRENCY, AND EVENT HANDLING

WEEK-10 Object-orientation – design issues for OOP languages – implementation of object oriented constructs – concurrency – semaphores – monitors – message passing
WEEK 11 – threads –statement level concurrency – exception handling – even handling
WEEK-12 UNIT TEST - IV

UNIT – V FUNCTIONAL AND LOGIC PROGRAMMING LANGUAGES 9

WEEK-13 Introduction to lambda calculus – fundamentals of functional programming languages – Programming with Scheme – Programming with ML

WEEK-14 introduction to logic and logic programming – Programming with Prolog – multi-paradigm languages

WEEK – 15 UNIT TEST - 5
WEEK-16,17 MODEL EXAM

REFERENCES:
Robert W. Sebesta, "Concepts of Programming Languages", Tenth Edition, Addison Wesley, 2012.
2. Michael L. Scott, "Programming Language Pragmatics", Third Edition, Morgan Kaufmann, 2009.
3. R. Kent Dybvig, "The Scheme programming language", Fourth Edition, MIT Press, 2009.
4. Jeffrey D. Ullman, "Elements of ML programming", Second Edition, Prentice Hall, 1998.
5. Richard A. O'Keefe, "The craft of Prolog", MIT Press, 2009.
6. W. F. Clocksin and C. S. Mellish, "Programming in Prolog: Using the ISO Standard", Fifth Edition, Springer, 2003.

CP7204 ADVANCED OPERATING SYSTEMS

UNIT I FUNDAMENTALS OF OPERATING SYSTEMS

WEEK 1: Overview – Synchronization Mechanisms – Processes and Threads
Process Scheduling –Deadlocks: Detection, Prevention and Recovery –
Models of Resources – Memory Management Techniques.

WEEK -2 UNIT TEST -1.

UNIT II - DISTRIBUTED OPERATING SYSTEMS 9

WEEK-3 Issues in Distributed Operating System – Architecture – Communication Primitives
WEEK-4 – Lamport's Logical clocks – Causal Ordering of Messages – Distributed Mutual Exclusion Algorithms –
WEEK-5 Centralized and Distributed Deadlock Detection Algorithms – Agreement Protocols.

WEEK-6 UNIT TEST - II

UNIT – III DISTRIBUTED RESOURCE MANAGEMENT
WEEK-7 Distributed File Systems – Design Issues - Distributed Shared Memory – Algorithms for Implementing Distributed Shared memory–Issues in Load Distributing –

WEEK-8 Scheduling Algorithms – Synchronous and Asynchronous Check Pointing and Recovery FaultTolerance – Two-Phase Commit Protocol – Nonblocking Commit Protocol – Security andProtection.
WEEK – 9 UNIT TEST -III
UNIT – IV REAL TIME AND MOBILE OPERATING SYSTEMS

WEEK-10 Basic Model of Real Time Systems - Characteristics- Applications of Real Time Systems Real Time Task Scheduling - Handling Resource Sharing - Mobile Operating Systems
WEEK-11 Micro Kernel Design - Client Server Resource Access – Processes and Threads – Memory Management - File system

WEEK-12 UNIT TEST – IV

UNIT – V CASE STUDIES

WEEK-13 Linux System: Design Principles - Kernel Modules - Process Management Scheduling -Memory Management - Input-Output Management - File System
WEEK-14 Interprocess Communication. iOS and Android: Architecture and SDK Framework - Media Layer -Services Layer - Core OS Layer - File System.
WEEK-15 UNIT TEST -V
WEEK-16,17 MODEL EXAM

REFERENCES:
11. Mukesh Singhal and Niranjan G. Shivaratri, "Advanced Concepts in Operating Systems – Distributed, Database, and Multiprocessor Operating Systems", Tata McGraw-Hill, 2001.
2. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, "Operating System Concepts", Seventh Edition, John Wiley & Sons, 2004.
3. Daniel P Bovet and Marco Cesati, "Understanding the Linux kernel", 3rd edition, O'Reilly, 2005.
4. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.
5. Neil Smyth, "iPhone iOS 4 Development Essentials – Xcode", Fourth Edition, Payload media, 2011.

NE7202 NETWORK AND INFORMATION SECURITY

UNIT I INTRODUCTION

.
WEEK 1: An Overview of Computer Security-Security Services-Security Mechanisms -Security Attacks-Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies

WEEK – 2 UNIT TEST -1

.

UNIT II - CRYPTOSYSTEMS & AUTHENTICATION

WEEK-3 Classical Cryptography-Substitution Ciphers-permutation Ciphers-Block Ciphers-
WEEK-4 – DESModesof Operation- AES-Linear Cryptanalysis, Differential Cryptanalysis-Hash Function
WEEK-5 SHA 512- Message Authentication Codes-HMAC - Authentication Protocols -
.

WEEK – 6 UNIT TEST -II

UNIT – III PUBLIC KEY CRYPTOSYSTEMS 9

WEEK-7 - Introduction to Public key Cryptography- Number theory- The RSA Cryptosystem and Factoring Integer- Attacks on RSA-The ELGamal Cryptosystem

WEEK-8 Digital Signature Algorithm-Finite Fields-Elliptic Curves Cryptography- Key management – Session and Interchange keys, Key exchange and generation-PKI

WEEK – 9 UNIT TEST -III

UNIT – IV SYSTEM IMPLEMENTATION 9

WEEK-10 Design Principles, Representing Identity, Access Control Mechanisms, Information Flow and Confinement Problem **Secure Software Development**: Secured Coding - OWASP/SANS Top Vulnerabilities -Buffer Overflows - Incomplete mediation - XSS -

WEEK-11 Anti Cross Site Scripting Libraries -
Canonical Data Format - Command Injection - Redirection - Inference – Application Controls

WEEK-12 UNIT TEST – IV

UNIT – V NETWORK SECURITY 9

WEEK-13 Secret Sharing Schemes-Kerberos- Pretty Good Privacy (PGP)-

WEEK-14 Secure Socket Layer (SSL)-Intruders – HIDS- NIDS - Firewalls - Viruses

WEEK-15 UNIT TEST - V

WEEK-16,17 MODEL EXAM

REFERENCES:

1. William Stallings, "Cryptography and Network Security: Principles and Practices", Third Edition, Pearson Education, 2006.
2. Matt Bishop ,"Computer Security art and science ", Second Edition, Pearson Education, 2002
3. Wade Trappe and Lawrence C. Washington, "Introduction to Cryptography with Coding Theory" Second Edition, Pearson Education, 2007
4. Jonathan Katz, and Yehuda Lindell, Introduction to Modern Cryptography, CRC Press, 2007
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5. Douglas R. Stinson, "Cryptography Theory and Practice", Third Edition, Chapman & Hall/CRC, 2006
6. Wenbo Mao, "Modern Cryptography – Theory and Practice", Pearson Education, First Edition, 2006.
7. Network Security and Cryptography, Menezes Bernard, Cengage Learning, New Delhi, 2011
8. Man Young Rhee, Internet Security, Wiley, 2003
9. OWASP top ten security vulnerabilities: http://xml.coverpages.org/OWASPTopTen. Pdf

IF7202 CLOUD COMPUTING

UNIT I CLOUD ARCHITECTURE AND MODEL

WEEK 1: Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture.
Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS)
Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management –Computing on demand.

WEEK -2 UNIT TEST -1

UNIT II - VIRTUALIZATION 9

WEEK-3 Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization -
WEEK-4 – Virtualization of CPU, Memory Virtualization Structures - Tools and Mechanisms -
WEEK-5, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation

WEEK-6 UNIT TEST - II

UNIT – III CLOUD INFRASTRUCTURE 9
WEEK-7 - Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges -
WEEK-8 Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

WEEK -9 UNIT TEST -III

UNIT – IV UNIT IV PROGRAMMING MODEL

WEEK-10 Parallel and Distributed Programming Paradigms – Map Reduce , Twister and Iterative Map Reduce **Secure Software Development**: – Design Principles, Representing Identity, Access Control Mechanisms, Information Flow and Confinement Problem
WEEK-11 Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, Cloud Sim

WEEK-12 UNIT TEST **IV**
UNIT – V SECURITY IN THE CLOUD 9
WEEK-13 Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security– Security Governance – Risk Management – Security Monitoring –

WEEK-14 Security Architecture Design – Data Security – Application Security – Virtual Machine Security – Identity Management and Access Control – Autonomic Security.

WEEK-15 UNIT TEST -V
WEEK-16,17 MODEL EXAM

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
4. Kumar Saurabh, " Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011.
5. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly
6. James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
7. Katarina Stanoevska-Slabeva, Thomas Wozniak, Santi Ristol, "Grid and Cloud Computing – A Business Perspective on Technology and Applications", Springer.
8. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.
9. Rajkumar Buyya, Christian Vecchiola, S.Tamarai Selvi, 'Mastering Cloud Computing", TMGH,2013.
10. Gautam Shroff, Enterprise Cloud Computing, Cambridge University Press, 2011
11. Michael Miller, Cloud Computing, Que Publishing,2008
12. Nick Antonopoulos, Cloud computing, Springer Publications,

CP7211 ADVANCED DATABASE LABORATORY

DISTRIBUTED DATABASE:
1. Consider a distributed database for a bookstore with 4 sites called S1, S2, S3 and S4. Consider the following relations:
Books (ISBN, primary Author, topic, total Stock, price)
Book Store (store No, city, state, zip, inventoryValue)
Stock (store No, ISBN, Qty)
Total Stock is the total number of books in stock and inventory Value is the total inventory value for the store in dollars.
Consider that Books are fragmented by price amounts into:
F1: Books: price up to $20
F2: Books: price from $20.01 to $50
F3: Books: price from $50.01 to $100
F4: Books: price $100.01 and above
Similarly, Book Stores are divided by ZIP codes into:
16
S1: Bookstore: Zip up to 25000

S2: Bookstore: Zip 25001 to 50000
S3: Bookstore: Zip 50001 to 75000
S4: Bookstore: Zip 75001 to 99999
Task: Write SQL query for the following
1. Insert and Display details in each table.
2. Find the total number of books in stock where price is between $15 and $55.
3. Update the book price of book No=1234 from $45 to $55 at site S3.
4. Find total number of book at site S2.
2. Implement deadlock detection algorithm for distributed database using wait-for graph and test with the following information.
Consider five transactions T1, T2, T3, T4 and T5 with
T1 initiated at site S1 and spawning an agent at site S2
T2 initiated at site S3 and spawning an agent at site S1
T3 initiated at site S1 and spawning an agent at site S3
T4 initiated at site S2 and spawning an agent at site S3
T5 initiated at site S3
The locking information for these transactions is shown in the following table
Transactions Data items lockedby transactionsData items transaction iswaiting forSite involvedin operations

OBJECT ORIENTED DATABASE:
3. A University wants to track persons associated with them. A person can be an Employee or Student. Employees are Faculty, Technicians and Project associates. Students are Full time students, Part time students and Teaching Assistants.
a) Design an Enhanced Entity Relationship (EER) Model for university database.
Write OQL for the following
i. Insert details in each object.
ii. Display the Employee details.
iii. Display Student Details.
iv. Modify person details.
v. Delete person details.
b) Extend the design by incorporating the following information.
Students are registering for courses which are handled by instructor researchers (graduate students). Faculty are advisors to graduate students. Instructor researchers' class 17
is a category with super class of faculty and graduate students. Faculty are having sponsored research projects with a grant supporting instruction researchers. Grants are sanctioned by different agencies. Faculty belongs to different departments. Department is chaired by a faculty. Implement for the Insertion and Display of details in each class.

PARALLEL DATABASE:
4. Consider the application for University Counselling for Engineering Colleges. The college, department and vacancy details are maintained in 3 sites. Students are allocated colleges in these 3 sites simultaneously. Implement this application using parallel database [State any assumptions you have made]. 5. There are 5 processors working in a parallel environment and producing output. The

output record contains college details and students mark information. Implement parallel join and parallel sort algorithms to get the marks from different colleges of the university and publish 10 ranks for each discipline.

ACTIVE DATABASE:

6. Create triggers and assertions for Bank database handling deposits and loan and admission database handling seat allocation and vacancy position. Design the above relational database schema and implement the following triggers and assertions.

a. When a deposit is made by a customer, create a trigger for updating customers account and bank account

b. When a loan is issued to the customer, create a trigger for updating customer's loan account and bank account.

c. Create assertion for bank database so that the total loan amount does not exceed the total balance in the bank.

d. When an admission is made, create a trigger for updating the seat allocation details and vacancy position.

DEDUCTIVE DATABASE:

7. Construct a knowledge database for kinship domain (family relations) with facts. Extract the following relations using rules.

Parent, Sibling, Brother, Sister, Child, Daughter, Son, Spouse, Wife, husband, Grandparent, Grandchild, Cousin, Aunt and Uncle.

WEKA TOOL:

8. Work with Weka tool classification and clustering algorithms using the given training data and test with the unknown sample. Also experiment with different scenarios and large data set

RID Age Income Student Credit_ratingClass: buys_ Computer

1 youth high no fair no
2 youth high no excellent no
3 middle_aged high no fair yes
4 senior medium no fair yes
5 senior low yes fair yes
6 senior low yes excellent no
7 middle_aged low yes excellent yes
8 youth medium no fair no
9 youth low yes fair yes
10 senior medium yes fair yes
11 Youth medium yes excellent yes
12 middle_aged medium no excellent yes
13 middle_aged high yes fair yes
14 senior medium no excellent no

QUERY PROCESSING

9. Implement Query Optimizer with Relational Algebraic expression construction and

execution plan generation for choosing an efficient execution strategy for processing the given query.
Also design employee database and test the algorithm with following sample queries.
a) Select empid, empname from employee where experience > 5
b) Find all managers working at London Branch **XML**
10. Design XML Schema for the given company database
Department (deptName, deptNo, deptManagerSSN, deptManagerStartDate, deptLocation)
Employee (empName, empSSN, empSex, empSalary, empBirthDate, empDeptNo, empSupervisorSSN, empAddress, empWorksOn)
Project (projName, projNo, projLocation, projDeptNo, projWorker)
a. Implement the following queries using XQuery and XPath
i. Retrieve the department name, manager name, and manager salary for every department'
ii. Retrieve the employee name, supervisor name and employee salary for each employee who works in the Research Department.
iii. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project.
iv. Retrieve the project name, controlling department name, number of employees and total hours worked per week on the project for each project with more than one employee working on it
b. Implement a storage structure for storing XML database and test with the above schema.

CP7212 CASE STUDY – OPERATING SYSTEMS DESIGN
(Team Work)

LAB EXERCISES:
A team of three or four students will work on assigned case study / mini-project. Case Study Mini-project can be designed on the following lines:
1. Development of a reasonably sized dynamically loadable kernel module for Linux kernel
2. Study educational operating systems such as Minix (http://www.minix3.org/), Weenix (http://weenix.cs.brown.edu/mediawiki/index.php/Weenix) and develop reasonably sized interesting modules for them
3. Study the Android open source operating system for mobile devices (http://source.android.com/) and develop / modify some modules.
4. Study any embedded and real-time operating system such as eCos (http://ecos.sourceware.org/) and develop / modify some modules.

REFERENCES:
1. Watts S. Humphrey, "Introduction to Team Software Process", Addison-Wesley, SEI Series in Software Engineering, 1999.
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