SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Computer Science and Engineering		LP: CS16402
B.E / B.Tech	: CS / IT (Autonomous)	Rev. No: 00
Regulation	: 2016	Date:
Sub. Code / Sub. Name	: CS16402 / DATABASE MANAGEMENT SYSTEMS	13.12.2017
Unit	: I	

Unit Syllabus: RELATIONAL DATABASES

Purpose of Database System – Views of data – Data Models – Database System Architecture – Introduction to relational databases - Relational Model - Keys -- Relational Algebra – Relational Calculus - SQL fundamentals - Advanced SQL features - Triggers- Embedded SQL– Dynamic SQL - Database connectivity

Objective:

This unit describes about SQL fundamentals and advanced SQL features also deals with database system architecture and relational databases.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Purpose of Database System, Views of Data	T1, Ch 1, pg(3-8) T2, Ch 1,pg(16-20)	BB/LCD
2	Data models - Types of data models , Database Architecture	T1, Ch 1, pg(8-9,23-25) T2, Ch 2,pg(29-37)	BB/LCD
3	Introduction to relational databases, relational model, Keys	T1, Ch2, pg(39-52) T2, Ch 9,pg(209-225) T2, Ch 10,pg(237-256)	BB/LCD
4	Relational Algebra - Select, Project, Set theory, Join, Division.	T1, Ch6, pg(217-239) T2, Ch 7,pg(143-157)	BB/LCD
5	Relational Calculus - Tuple and Domain relational calculus	T1, Ch6, pg(239-248) T2, Ch 8,pg(169-178)	BB/LCD
6	SQL Fundamentals - Overview of Query Languages(DDL,DML,TCL) - Basic	T1, Ch3, pg(57-103) T2, Ch 4,pg(69-84)	BB/LCD
7	Advanced SQL Features- Accessing SQL from programming Languages- Embedded SQL– Dynamic SQL	T1, Ch5, pg(157-158, 169-173), T2, Ch 4,pg(69-84)	BB/LCD
8	Triggers- Importance of Triggers, Triggers in SQL	T1, Ch5, pg(180-187) T2, Ch 9,pg(209-225)	BB/LCD
9	Database connectivity- JDBC, ODBC	T1, Ch5, pg(158-180)	BB/LCD

Course Outcome 1:

1. The student will be able to design the applications of database systems.
2. The students will be aware of relational database and will be able to write relational algebra expressions.
3. The students will be able to differentiate database systems from file systems by enumerating the features provided by database systems and describe each in both function and benefit.
4. Students will be handle to transform an information model into relational database schema and to use a data definition language and or utilities to implement the schema using DBMS.
5. The students will have the basic knowledge of SQL and will be able to construct queries using

* Session duration: 50 minutes

Sub. Code / Sub. Name : CS16402 / DATABASE MANAGEMENT SYSTEMS
Unit : **II**

Unit Syllabus: **DATABASE DESIGN**

Entity-Relationship Model – E-R Diagrams - Functional Dependencies – Non-loss Decompositio – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation Boyce/Codd Normal Form - Multi-valued Dependencies and Fourth Normal Form – Joi Dependencies and Fifth Normal Form

Objective:

This unit deals with the database system using ER diagram and depicts about the functional dependencies with all normal forms.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Entity-Relationship model – concepts with an example.	T1, Ch7, pg(262-274) T2, Ch 14,pg(339-354)	BB/LCD
11	E-R Diagrams	T1, Ch7, pg(274-283) T2, Ch 14,pg(339-354)	BB/LCD
12	Functional Dependencies - Non-loss Decomposition	T1, Ch8, pg(323-327) T2, Ch 12,pg(287-291)	BB/LCD
13	Functional Dependencies - First Second Normal forms	T1, Ch8, pg(327-333) T2, Ch 12,pg(291-299)	BB/LCD
14	Functional Dependencies - Third Normal form	T1, Ch8, pg(336-337) T2, Ch 12,pg(291-299)	BB/LCD
15	Dependency Preservation - Boyce/codd Normal Forms	T1, Ch8, pg(333-336) T1, Ch8, pg(346-348) T2, Ch 12,pg(299-307)	BB/LCD
16	Multi-valued Dependencies and Fourth Normal Form	T1, Ch8, pg(355-360) T2, Ch 13,pg(316-320)	BB/LCD
17, 18	Join Dependencies and Fifth Normal Form	T1, Ch8, pg(360-361) T2, Ch 13,pg(320-326)	BB/LCD

Course Outcome 2:

1. The students will be sound in designing the principles of logical design of database including the E-R method and normalization approach.
2. The students will be able to Construct and normalize conceptual data models and develop logical data models.
3. The students shall be able to provide solutions to broad range of query and data update problems.

* Session duration: 50 mins

Sub. Code / Sub. Name : CS16402 / DATABASE MANAGEMENT SYSTEMS
Unit : III

Unit syllabus: TRANSACTION MANAGEMENT

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit -- Save Points – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Recovery Isolation Levels

Objective

In this unit, students obtain the knowledge about the fundamental concepts of transaction processing, concurrency control techniques and also the importance of locking protocols techniques.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Introduction to transaction processing concepts.	T1, Ch14, pg(627-629) T2,Ch15, pg(366-370) R1,Ch20, pg(725-736)	BB/LCD
20	Transaction Recovery -ACID properties	T1, Ch14, pg(629-631) T2, Ch15, pg(370-373) R1,Ch20, pg(736-737)	BB/LCD
21	System Recovery – Media Recovery	T1, Ch16, pg(721-758) T2, Ch15, pg(373-375)	BB/LCD
22, 23	Two Phase Commit Protocols - save points	T1, Ch19, pg(832-836,756) T2, Ch15, pg(375-377) R1,Ch22, pg(807-808)	BB/LCD
24	Concurrency – Need for Concurrency	T2, Ch16, pg(383-388) R1,Ch21, pg(759-760)	BB/LCD
25	Locking Protocols– Two Phase Locking	T1, Ch15, pg(661-669) T2, Ch16, pg(395-396) R1,Ch21, pg(760-767)	BB/LCD
26	Dead lock	T1, Ch15, pg(674-679) T2, Ch16, pg(392-394) R1,Ch21, pg(767-770)	BB/LCD
27	Recovery Isolation Levels	T2, Ch16, pg(398-401) R1,Ch21, pg(789-807)	BB/LCD

Course Outcome 3:

1. The students will be able to identify the issues of transaction processing and concurrency control.
2. The students will be aware of how database are affected by real-world transactions.
3. The students will be able to provide solution to concurrency control and recovery mechanisms for practical problems.
4. The students will able to design the Transaction Processor.

* Session duration: 50 mins

Sub. Code / Sub. Name : CS16402 / DATABASE MANAGEMENT SYSTEMS
Unit : IV

Unit syllabus: IMPLEMENTATION TECHNIQUES

Overview of Physical Storage Media – RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Catalog Information for Cost Estimation - Query Optimization

Objective

This unit describes about the physical storage and file organization techniques, query processing and cost estimation which help the students in physical DB design and advanced databases.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Physical storage media-RAID	T1,Ch 10,pg(429-444) R1,Ch 17,pg(583)	BB/LCD
29	RAID -Levels	T1,Ch 10,pg(444-449) R1,Ch 17,pg(617-621)	BB/LCD
30	File Organization, organization of records in files	T1,Ch 10,pg(451-462) R1,Ch 17,pg(616-617)	BB/LCD
31	Indexing and Hashing –Ordered Indices -	T1,Ch 11,pg(476-485) https://www.tutorialcup.com/dbms/hashing-	BB/LCD
32	B+ - Tree Index files and B-Tree Index files	T1,Ch 11,pg(485-500) R1,Ch 18,pg(631-660)	BB/LCD
33	Static Hashing – Dynamic Hashing	T1,Ch 11,pg(509-523) https://www.tutorialspoint.com/dbms/dbms_hashing.htm	BB/LCD
34	Query Processing Overview	T1,Ch 12,pg(537-539) T2, Ch18, pg(448-453) R1,Ch 19,pg(679-710)	BB/LCD
35	Catalog Information for Cost Estimation	T1,Ch 12,pg(540-546) T2, Ch18, pg(454-463) R1,Ch 19,pg(710-721)	BB/LCD
36	Query Optimization	T1,Ch 13,pg(579-614) T2, Ch18, pg(454-463) R1,Ch 19,pg(721-723)	BB/LCD

Course Outcome 4:

1.The students will be able to handle evaluation techniques and and query optimization.
2.The students will be familiar with basic database storage structures and access techniques.
3. The students will be able to identify issues in accessing techniques and provide appropriate solutions like Indexing,B+tree.

* Session duration: 50 mins

Sub. Code / Sub. Name : CS16402 / DATABASE MANAGEMENT SYSTEMS
Unit : V

Unit syllabus : ADVANCED TOPICS

Introduction to Distributed databases - Cloud Databases - Data warehouse and Mining - Mobile Databases - XML Databases - Multimedia Databases.

Objective

This unit depicts about the cloud databases and the concepts of information retrieval.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Introduction to Distributed databases- storage, transaction, commit protocol	T1,Ch 19,pg(825-838) T2,Ch 21,pg(547-560) R1,Ch 25,pg(877-913)	BB/LCD
38	Introduction to Distributed databases – Concurrency, Availability, query processing	T1,Ch 19,pg(839-861) T2,Ch 21,pg(547-572) R1,Ch 19,pg(877-913)	BB/LCD
39	Cloud Databases – challenges, Data storage, Representation	T1,Ch 19,pg(861-865) https://en.wikipedia.org/wiki/Cloud_database	BB/LCD
40	Cloud Databases – Partitioning and retrieving data Transaction replication	T1,Ch 19,pg(865-870) http://searchcloudapplications.techtarget.com/definition/cloud-database	BB/LCD
41	Data warehousing	T1,Ch 20,pg(887-893) T2,Ch 22,pg(602-616) R1,Ch 29,pg(1067-1080)	BB/LCD
42	Data mining	T1,Ch 20,pg(893-909) T2,Ch 22,pg(616-618) R1,Ch 28,pg(1036-1060)	BB/LCD
43	Mobile Databases	T1,Ch 25,pg(1079-1085)	BB/LCD
44	XML Databases	T1,Ch 23,pg(981-1019) T2,Ch 27,pg(783-814)	BB/LCD
45	Multimedia Databases	T1,Ch 25,pg(1076-1079)	BB/LCD

Course Outcome 5:

1. The students will be able to select the appropriate high performance database like parallel and distributed databases.
2. The students will be able to solve application issues and current trends in database technologies.
3. The students will be able to represent the data using XML database for better interoperability.
4. The students will be able to solve the issues related to the data storage and retrieval.
5. The students will be able to apply data mining techniques and methods to large data sets.

□ Use data mining tools

* Session duration: 50 mins

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Mapping CO – PO:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1											
CO2											
CO3											
CO4											
CO5											

A – Excellent ; B – Good ; C - Average

TEXT BOOK:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, —Database System Conceptsl, Sixth Edition, Tata McGraw Hill, 2010.
2. C.J.Date, A.Kannan, S.Swamynathan, —An Introduction to Database Systemsl, Eighth Edition, Pearson Education, 2006.

REFERENCES:

1. Ramez Elmasri, Shamkant B. Navathe, —Fundamentals of Database Systemsl, Sixth Edition, Pearson Education, 2010.
2. Raghu Ramakrishnan, Johannes Gehrke —Database Management Systemsl, Fourth Edition, Tata Mc Graw Hill, 2010.
3. G.K.Gupta, —Database Management Systemsl, Tata McGraw Hill, 2011.
4. Carlos Coronel, Steven Morris, Peter Rob, —Database Systems: Design, Implementation and Managementl, Ninth Edition, Cengage Learning, 2011

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