

UkaTarsadiaUniversity



B.C.A.

Database Management Systems (030010102)

1st Semester

EFFECTIVE FROM JUNE-2014

UKA TARSADIA UNIVERSITY
BCA (1st Semester) Syllabus, 2014-2015

Course Code: 030010102

Course Title: Database Management Systems

Course Credits: 4

Total Hours: 48

[Lectures: 04, Tutorial: 00, Practical: 04]

Prerequisites: Mathematics for Computer Applications

Prerequisites By Topics: Set Theory

Objectives: To introduce the need of database systems, data modelling and database designing, and to make use of SQL for efficient storage and retrieval of data

- 1 **File Organization and Structure** [07 Hours]
 - 1.1. Overview of Physical Storage Media
 - 1.2. Types of File Organization
 - 1.3. Organization of Records in Files
 - 1.4. Data Dictionary Storage
 - 2 **Database Management System** [09 Hours]
 - 2.1. Purpose
 - 2.2. View of Data
 - 2.3. Database Languages: DDL and DML
 - 2.4. Relational, Object-Oriented and Semi Structured Databases
 - 2.5. Data Storage and Querying
 - 2.6. Database Architecture
 - 2.7. Database Users and Administrator
 - 3 **Data Modelling** [08 Hours]
 - 3.1. E-R Model and Constraints
 - 3.2. E-R Diagram and Design Issues
 - 3.3. Weak and Strong Entity Set
 - 3.4. Extended E-R Features
 - 3.5. Relational Model Concepts: Domain, Tuples, Attributes, Relations, Super Key, Candidate Key and Primary Key
 - 3.6. Relational Model Constraints: Domain Constraints, Key Constraints, Entity and Referential Integrity, and Foreign Key
 - 4 **Relational Database Design Process** [09 Hours]
 - 4.1. E. F. Codd's Rule
 - 4.2. Functional Dependency
 - 4.3. Anomalies in Database Design : Redundancy, Insertion, Updating and Deletion
 - 4.4. Decomposition of Relation, Lossless Join and Dependency Preservation Property
 - 4.5. Normalization: First Normal Form, Second Normal Form, Third Normal Form
 - 5 **Database Language- Structured Query Language** [06 Hours]
 - 5.1. Data Types of Attributes
 - 5.2. DDL Statements and Constraints in SQL
 - 5.3. DML Statements in SQL
 - 6 **Retrieving Data using SQL** [09 Hours]
 - 6.1. Retrieving and Modifying Data
 - 6.2. Summarizing and Grouping Data
 - 6.3. IN, BETWEEN and LIKE Predicate, Set, Arithmetic and Logical Operators, and Aggregate Functions
 - 6.4. Joins, Sub Queries
- [Note:
i. Implementation of SQL Queries using DB2.
ii. In allied course, Discrete Mathematics, Relational Algebra should also be taught in terms of tuples and attributes.]

Course Outcomes:

- CO1: Describe file organization and record organization.
CO2: Differentiate between database approaches and file system approach.
CO3: Understand the concept of database, its architecture, components and users.
CO4: Compare the E-R model and relational database models.
CO5: Design an entity-relationship model based on user requirements.

- CO6: Design a database using relational database model.
 CO7: Use data definition and manipulation statements over one or more tables using SQL to store and retrieve data.

Course Objectives and Course Outcomes Mapping:

introduce data file structures : CO1
 introduce the need of database systems : CO2,CO3
 introduce data modelling :CO4, CO5, CO6
 introduce database designing : CO6
 make use of SQL : CO7

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcome						
		CO1	CO2	CO3	CO4	CO5	CO6	CO7
1	File Organization and Structure	✓						
2	Database Management System		✓	✓				
3	Data Modelling				✓	✓	✓	
4	Relational Database Design Process						✓	
5	Database Language- Structured Query Language							✓
6	Retrieving Data using SQL							✓

Laboratory:

- ❖ The practical list shall not be repeated for next two consecutive years.
- ❖ Laboratory supervisor or course teacher shall sign in the journal only if he/ she feel satisfied by the work of student.
- ❖ Journal shall be verified twice during the 10th week of semester by course teacher.
- ❖ Journal must not be certified if required number of problems are not included and not written clearly or copied.
- ❖ After the approval of the Programme Coordinator, the list of problem definition shall be kept by concern teacher on web site before the commencement of the semester.
- ❖ Problem list shall contain practical problems from three units are as follow:

Unit No.	Minimum No. of problem	Required No. of problem to get journal certified	Remarks
5	3	3	Unit-5 : 5.1 : Data Types
5	7	7	Unit-5 : 5.2 : DDL Statement
5	21	21	Unit-5 : 5.3 : Insert , Delete , Update
5	40	40	Unit-5 : 5.4 : Numeric and string function
6	15	15	Unit-6 : 6.1 :Retrieving and Modifying
6	15	15	Unit-6 : 6.2:Summarizing and Grouping Data
6	20	20	Unit-6 : 6.3:Use of predicate and aggregate function
6	20	20	Unit-6: 6.4: Joins and Sub queries.
3	2	2	Unit-3: 3.5:Normalizaton-1NF,2NFand 3NF

Computing Environment:

A student must have the following computing environment in laboratory and or on his/her laptop and.

- ❖ IBM DB2 9.0

Modes of Transaction (Delivery):

- ❖ Lecture method: along with various appropriate audio-visual aids for all the units.
- ❖ Apart of lecture method, assignment activity shall be designed for unit 1, 2 and 4.

Activities/Practicum:

The following activities shall be carried out by the students.

- ❖ History of data model.
- ❖ Network Model
- ❖ Design the Normalized database.

The following activities shall be carried out by the teacher.

- ❖ Demonstrate the process of role database design using some existing company reports.

Text Book:

1. Elmasri and Navathe -Fundamentals of Database Systems - Pearson Education.
2. Allen, G. - Beginning DB2: From Novice to Professional - Apress.

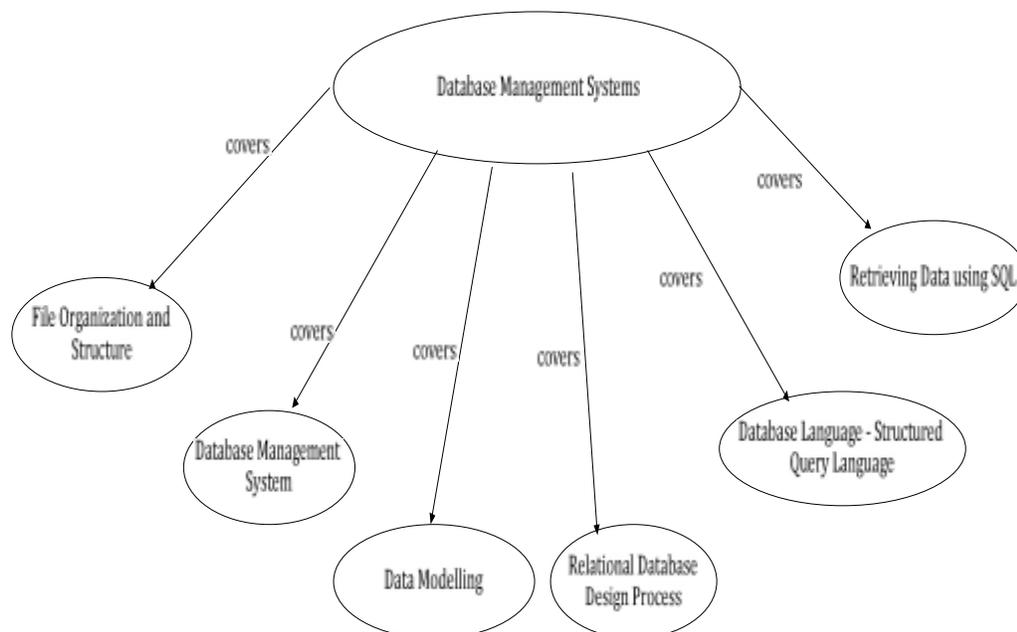
Reference Books:

1. Korth - Database System Concepts - Tata McGraw Hills.
2. S. K. Singh - Database Systems: Concepts, Design and Applications - Pearson Education.
3. V. K. Jain – Database Management Systems – Dreamtech Press.
4. Rob, and Coronel - Database System Concept - Cengage Learning.
5. Deshpande – SQL & PL/SQL for Oracle 10g – Dreamtech Press.

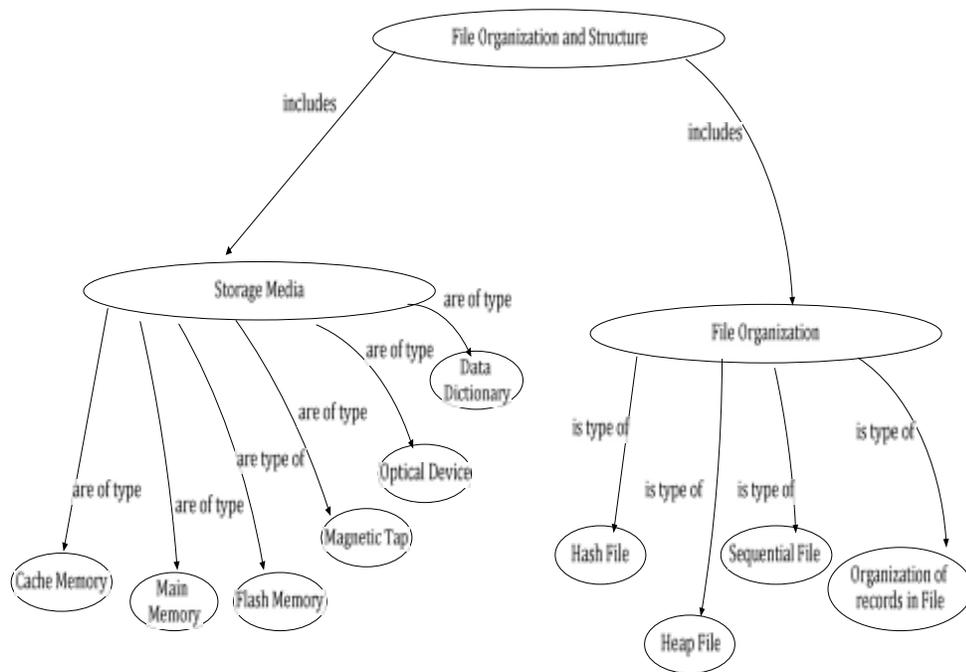
Concept Map:

It is a hierarchical / tree based representation of all topics covered under the course. This gives direct / indirect relationship /association among topics as well as subtopics.

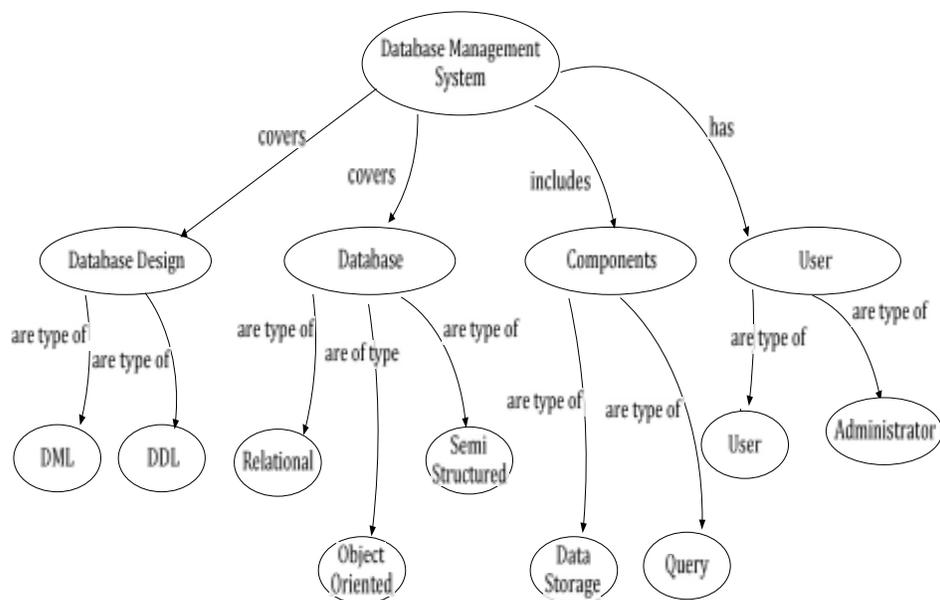
Database Management Systems



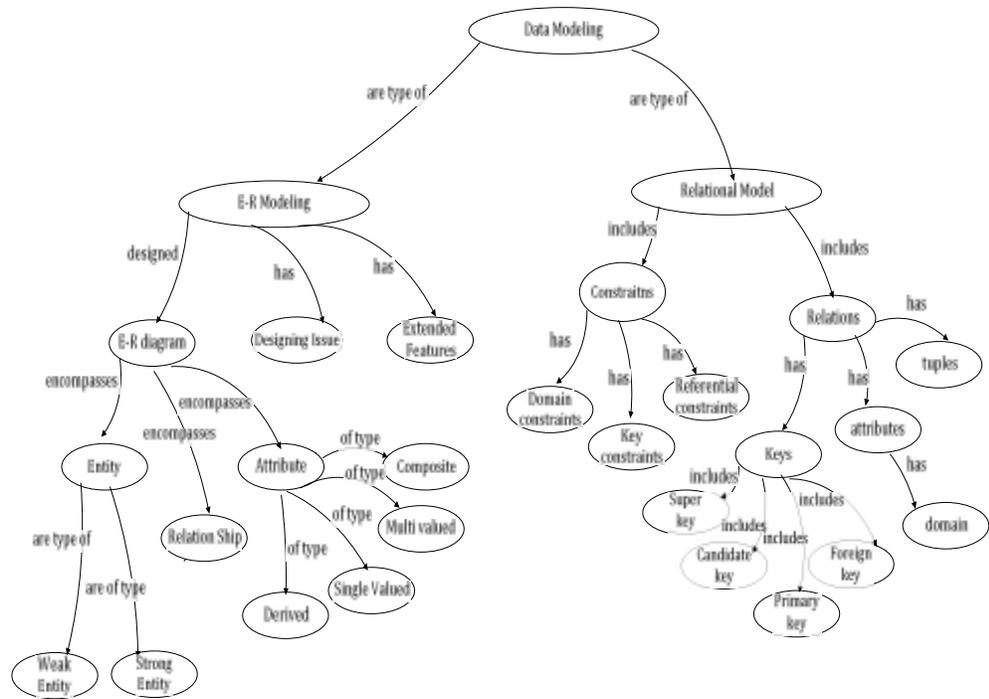
Unit-1: File Organization and Structure



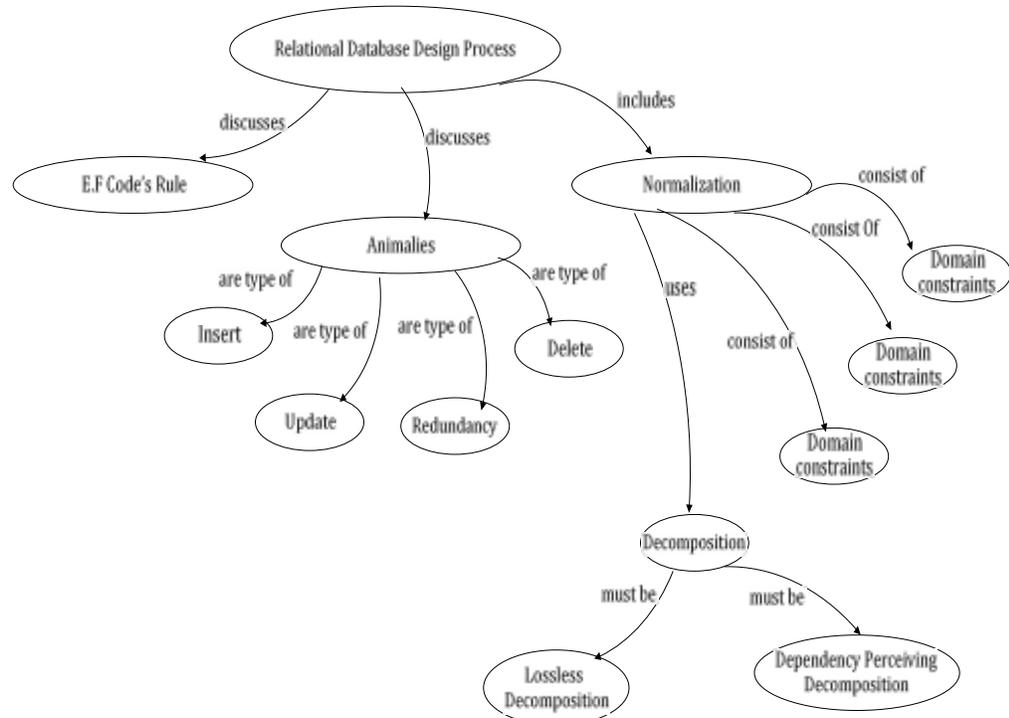
Unit-2: Database Management System



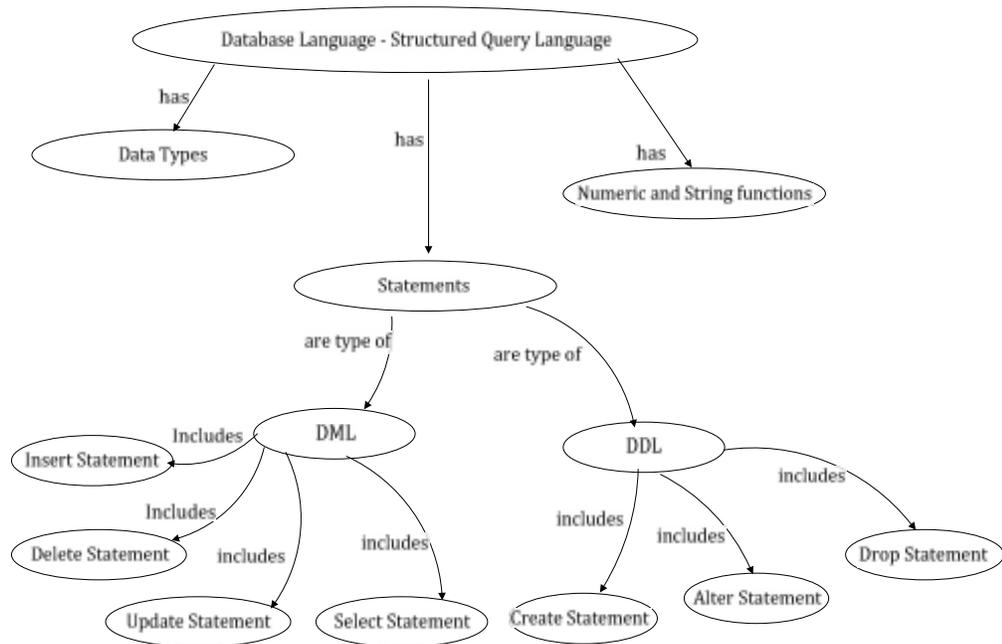
Unit-3: Data Modelling



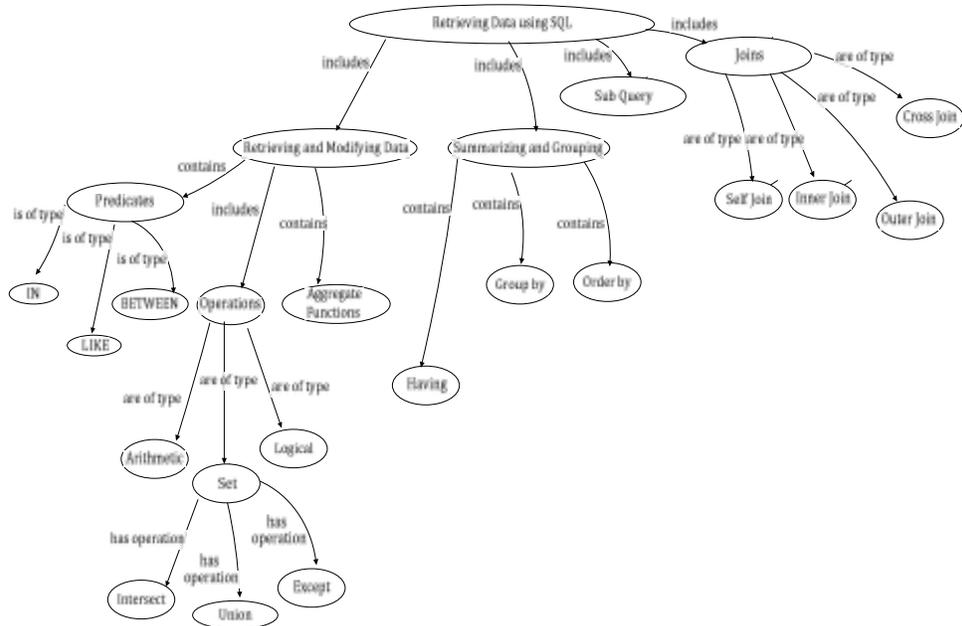
Unit-4: Relational Database Design Process



Unit-5: Database Language- Structured Query Language



Unit-6: Retrieving Data using SQL



Assessment:

The weightage of CIE and University examination shall be as per the University regulations.
Composition of CIE shall be

Assessment Code	Assessment Type	Duration of each	Occurrence	Each of marks	Weightage in CIE of 40 marks	Remarks
A1	Quiz	45 mins	2	20	4X 2 = 8	Shall be taken at the end of the 1st, 4th, 5th and 6th
A2	Unit Test	1.5 hrs.	2	30	6X 2 = 12	Shall be taken at the end of 1st, 2ND, 3rd and 4th unit.
A3	Assignment	-	2	10	2.5 X 2 = 5	Shall be taken at the end of 1st, 2ND, and 4th unit.
A4	Internal (Theory)	3 hrs.	1	60	15X 1 = 15	Shall be taken at the end of 1st, 2ND, and 4th unit.
A5	Practical Test	1 hrs.	1	20	4 x 1 = 4	Shall be taken at the end of 5th and 6th unit.
A6	Practical Internal	2 hrs.	2	30	6 x 2 = 12	Shall be taken at the end of 5th and 6th unit.
A7	Viva and Journal	-	-	-	4 X 1 = 4	

- ❖ A3 Guidelines:
 - List of definition shall be kept on website by the course teacher during the 8th week of semester.
 - Student shall receive up to 5% bonus marks of full marks on 2 days early submission.
 - Student shall receive up to 10% penalty marks of full marks on 2 days late submission, and 0 marks on no submission.
- ❖ Syllabus for each CIE parameter shall be covered by the date of the corresponding test.
- ❖ No make-up work shall be accepted for missed or failed tests.

Course Assessment with Course Outcomes Mapping

Assessment	Course Outcomes						
	CO1	CO2	CO3	CO4	CO5	CO6	CO7
A1	✓	✓	✓		✓	✓	✓
A2	✓	✓	✓	✓	✓	✓	✓
A3	✓	✓	✓	✓	✓	✓	✓
A4	✓	✓				✓	
A5							✓
A6							✓
A7	✓	✓	✓		✓	✓	✓

Question Bank:

Question Bank must be prepared which consists of several types of questions namely Multiple Choice Questions, Fill in the blanks, Short type questions, and long type questions. It shall also consist of widget definition.

Academic Honesty:

Coursework is assumed to be accomplished individually (otherwise stated). Any portion of submission taken directly from anywhere (like statements in assignment/report etc.) without modification must be accompanied with the properly formatted reference giving credit to the author and to the source.

UFM:

- ❖ If two or more submitted practical code are too similar for coincidence, a penalty will be imposed that will usually be the same for the student who did the original as for the one copying from it.
- ❖ Any ascertained fact of breaking institute policy will be associated with one or all of the following: (i) zero marks for the work; (ii) report to the Programme coordinator; (iii) report to the Director.

Discussion Group:

Students are welcome to post on the Course Discussion Board available on SRIMCA View Course Webpage. It is responsibility of the concern Course teacher to maintain Discussion Board.

Attendance:

- ❖ Attendance means being present for the entire class session. Those arriving significant late or leaving significantly early without prior permission shall be counted as ABSENT for the entire class session.
- ❖ Concern teacher must clearly state his/her attendance policies at the first class meeting.