B.C.A. 1st Semester

Teaching Schedule

Course: 030010110- CC2 Database Management Systems

Objective: 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.

Course Outcomes: Upon completion of the Course, students shall be able to

CO1: Describe file organization and record organization.
CO2: Differentiate between database approaches and file system approach.
CO3: Describe 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.

Unit	Sub Unit	No. of Lecture (s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Evaluation Parameters
Unit 1: File Organization and Structure						
1	1.1	2	Overview of Physical Storage Media	HK#10 – Page no. – 429-432	Presentation, Audio-Visual Tool	
	1.2	2	Types of File Organization	HK#10 – Page no. – 457-462, SK#3 – Page no. – 122-130	Presentation	
	1.3	2	Organization of Records in Files	HK#10 – Page no. – 451-457	Presentation	**Unit Test-1**
	1.4	1	Data Dictionary Storage	HK#10 – Page no. – 462-464	Chalk & Talk	
Unit 2: Database Management System						
2	2.1	1	Purpose	HK#10 – Page no. – 462-464	Discussion	
	2.2	1	View Of Data	SK#1 – Page no. – 4,5, HK#1 – Page no. – 6-9	Chalk & Talk	
	2.3	1	Database Languages : DDL and DML	HK#1 – Page no. – 10-15		
	2.4	2	Relational, Object-Oriented and Semi Structured Databases	HK#1 – Page no. – 9		
	2.5	2	Data Storage and Querying	HK#1 – Page no. – 20-22		
	2.6	2	Database Architecture	HK#2 – Page no. – 44-48		**Quiz**
	2.7	1	Database Users and Administrator	HK#1 – Page no. – 27-29	Reading and Discussion	
Unit 3: Data Modeling						
3	3.1	1	E-R Model and Constraints	HK#7 - Page no. - 237-248,	Reading and	

				SK#6 - Page no. - 262-270	Discussion	
	3.2	2	E-R Diagram and Design Issues	https://www.coursera.org/learn/analytics-mysql/lecture/6kP20/how-entity-relationship-diagrams-work	Audio-visual tool	
	3.3	1	Weak and Strong Entity Set	HK#7 - Page no. – 279-283, EN#3 - Page no. – 76 – 77	Chalk & Talk	
	3.4	1	Extended E-R Features	HK#7 - Page no. – 295-304	Chalk & Talk, Presentation	
	3.5	2	Relational Model Concepts: Domain, Tuples, Attributes, Relations, Super Key, Candidate Key and Primary Key	EN#5 – Page no. – 146-153	Chalk & Talk	
	3.6	2	Relational Model Constraints: Domain Constraints, Key Constraints, Entity and Referential Integrity, and Foreign Key	EN#5 – Page no. – 153-161	Chalk & Talk	
Unit 4 : Relational Database Design Process						
4	4.1	1	E. F. Codd's Rule	SK#5 –Page no. – 179 - 180	Chalk and Talk	**Open Book**
	4.2	2	Functional Dependency	http://nptel.ac.in/courses/106106093/9	Audio-Visual tool	
	4.3	2	Anomalies in Database Design : Redundancy, Insertion, Updating and Deletion	HK #6 – Page no. 201-203 HK #7 – Page no. 263-266	Discussion, Chalk and Talk	
	4.4	2	Decomposition of Relation, Lossless Join and Dependency Preservation Property	SK#9 – Page no. – 327 - 332	Chalk and Talk	
	4.5	4	Normalization: First Normal Form, Second Normal Form, Third Normal Form	http://nptel.ac.in/courses/106106093/9	Discussion, Audio-Visual tool	
Unit 5 : Database Language – Structured Query Language						
5	5.1	2	Data Types of Attributes	http://dev.mysql.com/doc/refman/5.7/en/data-types.html	Example based teaching	
	5.2	2	DDL Statements and Constraints in SQL	http://dev.mysql.com/doc/refman/5.7/en/sql-syntax-data-definition.html	Hands-on by the students	
	5.3	2	DML Statements in SQL	http://dev.mysql.com/doc/refman/5.7/en/sql-syntax-data-manipulation.html	Hands-on by the students	**Unit Test-2**
Unit 6 : Retrieving Data using SQL						

6	6.1	2	Retrieving and Modifying Data	IB#6 Page no. – 179 - 180	Chalk & Talk	
	6.2	3	Summarizing and Grouping Data	http://dev.mysql.com/doc/refman/5.7/en/group-by-functions-and-modifiers.html	Presentation and Chalk and Talk	
	6.3	2	IN, BETWEEN and LIKE Predicate, Relational, Arithmetic and Logical Operators, and Aggregate Functions	http://dev.mysql.com/doc/refman/5.7/en/non-typed-operators.html	Example based teaching	
	6.4	3	Joins, Sub Queries	http://dev.mysql.com/doc/refman/5.7/en/join.html	Example based teaching	**Internal**

Textbooks:

1. H. Korth, "Database System Concepts", Tata McGraw Hills.[HK]
2. Ivan Bayross, MySQL 5 for Professionals, SPD.[IB]

References :

1. S.K. Singh. "Database Systems Concepts,Design and Applications", Pearson Education.[SK]
2. Elmasri Navathe. "Fundamentals of Database Systems", Pearson Education.[EN]
3. MySQL Reference Manual - https://dev.mysql.com/doc/refman/5.6/en/index.html

Note: # denotes chapter number.

Course objectives and Course outcomes mapping:

- Introduce data file structures : CO1
- Introduce the need of database systems : CO2,CO3
- Introduce data modeling :CO4, CO5, CO6
- Introduce database designing : CO7
- 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 Modeling				✓	✓	✓	✓
4	Relational Database Design Process						✓	✓
5	Database Language- Structured Query Language							✓
6	Retrieving Data using SQL							✓

Programme Outcomes:

PO1: Ability to understand the concepts of key areas in computer science.
PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.
PO3: Effective communication and presentation skill.

PO4: Ability to understand professional and ethical responsibility.
PO5: Recognition of the need for life-long learning.

Course outcomes and Programme outcomes mapping:

Programme Outcomes	Course Outcomes						
	CO1	CO2	CO3	CO4	CO5	CO6	CO7
PO1	✓	✓	✓	✓		✓	
PO2					✓		✓
PO3		✓	✓	✓	✓		
PO4			✓			✓	
PO5	✓	✓	✓	✓	✓	✓	✓

Computing Environment:

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

- MySQL 5.0 or above

Modes of Transaction (Delivery):

Unit No	Topic Detail	Teaching Approach	PO mapped
1	1.2 Types of File Organization	Self-created animated PPTs to explain file organization so that students can visualize the concept.	PO1, PO5
4	4.5 Normalization: First Normal Form, Second Normal Form, Third Normal Form	Questions to ponder: For each topic there will be two questions, one is of remembering or understanding type while another of analysis type. These questions will be asked in between of the lectures to ponder students about the topic.	PO2, PO5

Activities/Practicum:

The following activities shall be carried out by the students.

- Create a database and perform DDL and DML statement using MS Access during laboratory session.

The following activities shall be carried out by the teacher.

Learner	Activities to be done	PO mapped
For slow learners	Puzzles	PO1, PO2, PO3, PO4, PO5
For advanced learners	Collect day to day receipts/bill and design database.	PO1, PO2, PO3, PO4, PO5
For all	Data retrieval with application programs.	PO1, PO2, PO3, PO4, PO5

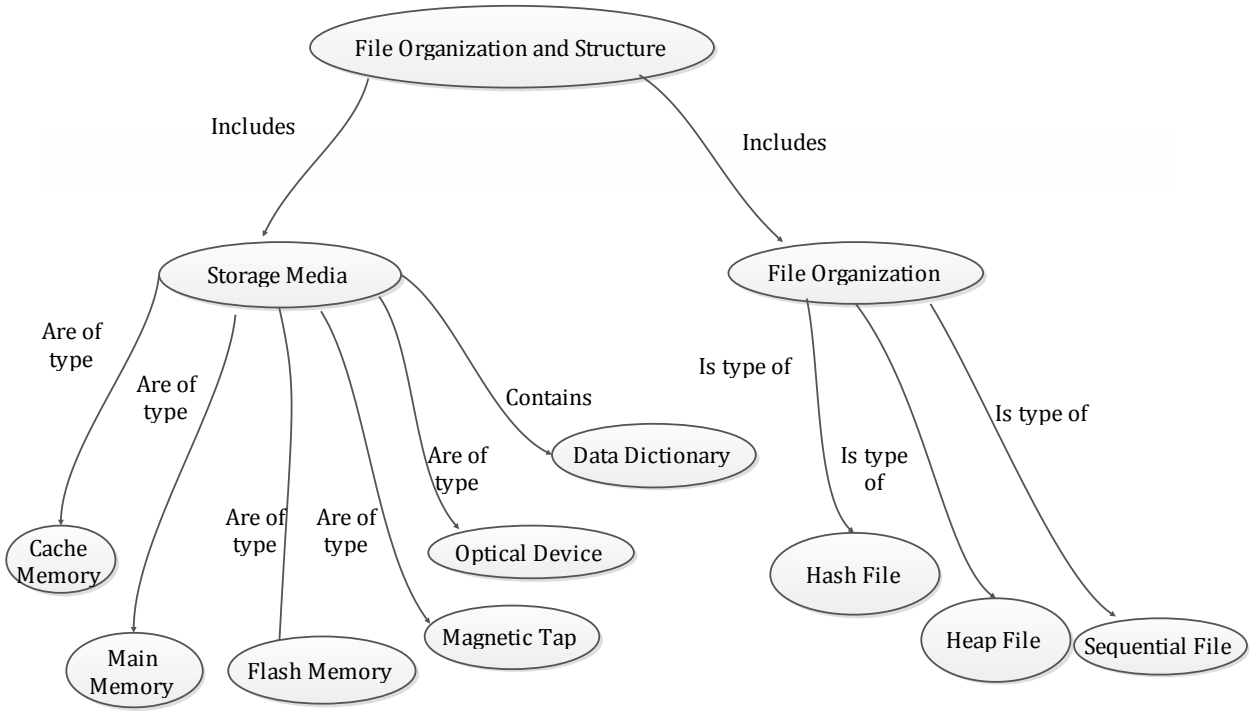
Number of Practical Problems in Journal: 18

Total sets to be developed for each division: 2

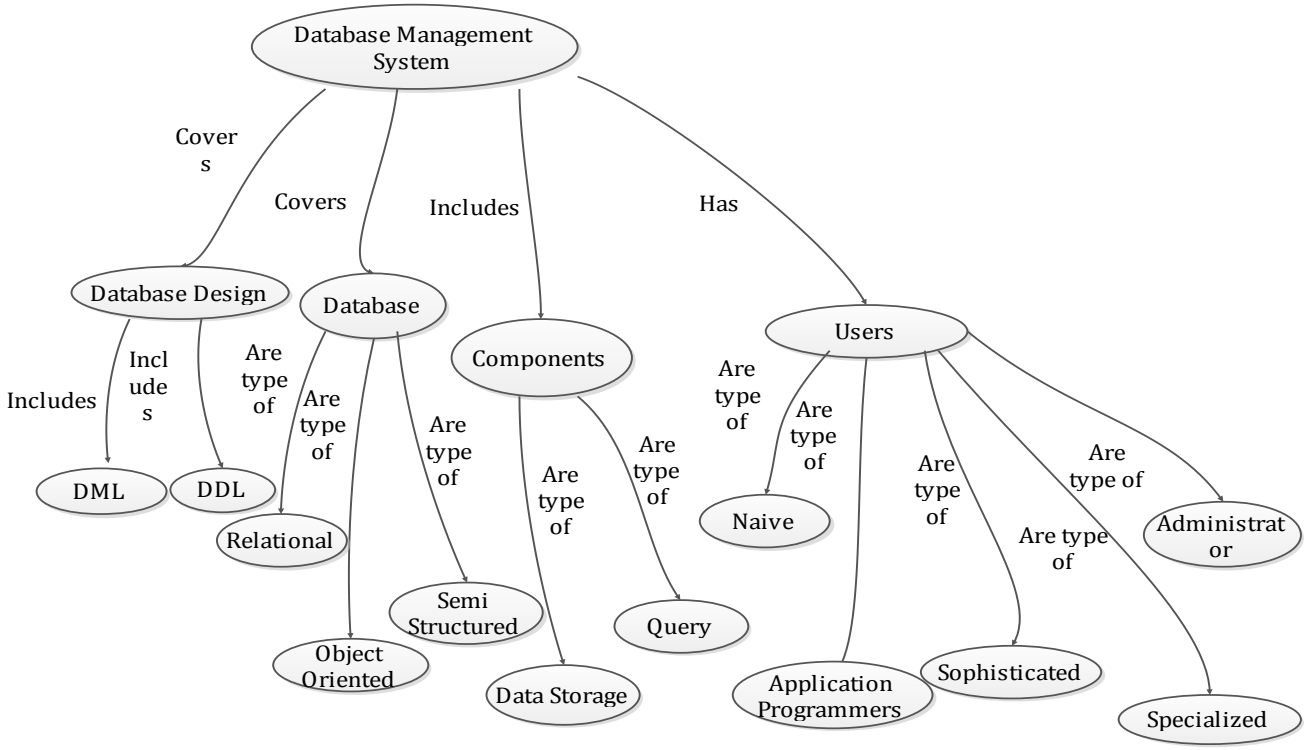
Unit Number	Number of Questions	Time required to implement and debug the question (in hours)	Minimum required of Journal Certification
Unit 3	02	05	02
Unit 4	04	07	03
Unit 5	06	19	05
Unit 6	08	41	08
Total	20	72	18

Concept map:

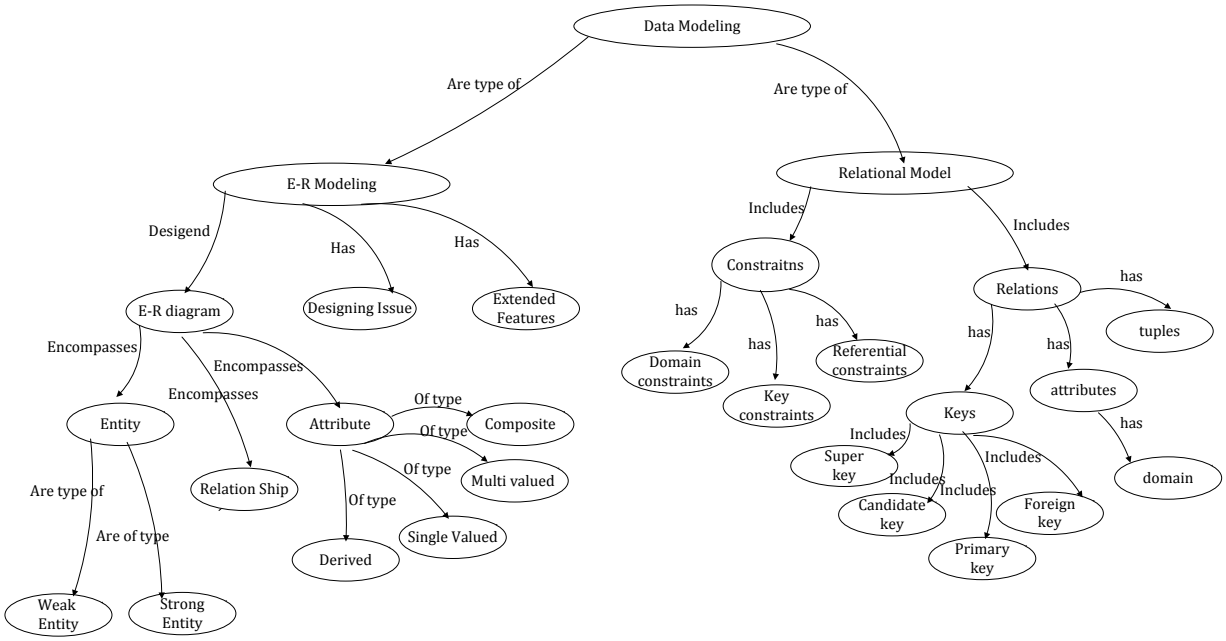
Unit 1: File Organization and Structure



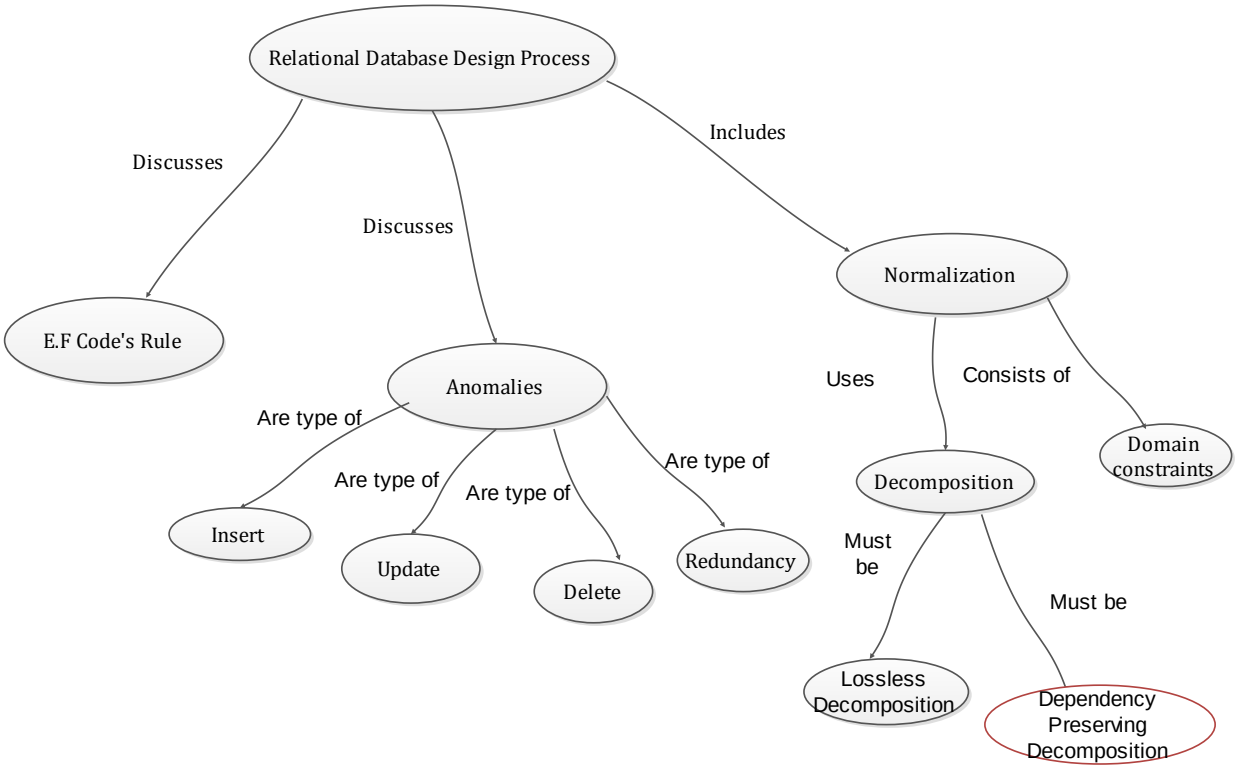
Unit 2: Database Management System



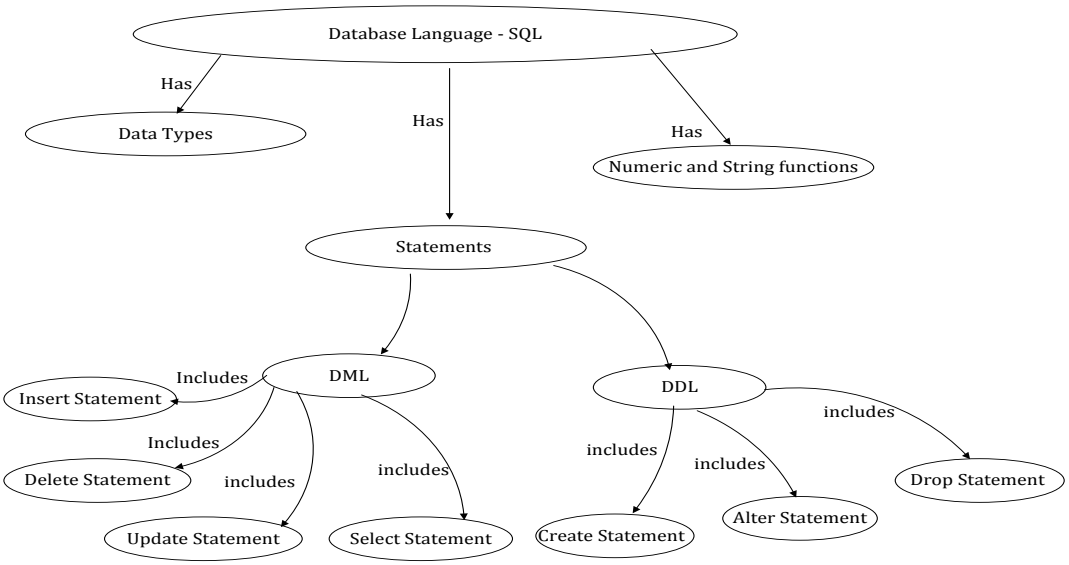
Unit 3: Data Modeling



Unit 4: Relational Database Design Process



Unit 5: Database Language- Structured Query Language



Unit 6: Retrieving Data using SQL