Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
CE42	Database management System	3	--	-	3	--	-	3

	Examination Scheme		
	Theory Marks		
	ISE	MSE	ESE
	10	30	100 (60% Weight age)

Pre-requisite Course Codes	-

At the end of successful completion of this course, student will be able to

Course Outcomes	CO1	Design effective database systems, leading to development of elegant Information System.
	CO2	Analyze the real world problem and construct a relational database.
	CO3	Construct a secure database.
	CO4	Design a relation database using concept of functional dependencies.
	CO5	Analyze the effect of concurrency control for transaction processing.

Module No.	Unit No.	Topics	Ref.	Hrs.
1		**Introduction Database Concepts and ER Modeling**		
1	1.1	**Introduction Database Concepts** Introduction, Characteristics of databases, File system V/s Database system, Users of Database system, Database Administrator, Concerns when using an enterprise database, Data Independence, codd's Rule, DBMS system architecture,	1,2,3	04
	1.2	**ER Modeling**		
		Introduction to ER model, Benefits of Data Modeling, Types of data Models, Phases of Database Modeling, The Entity-Relationship (ER) Model, Generalization, Specialization and Aggregation, Extended Entity-Relationship (EER) Model.		04
2		**Relational Algebra and SQL**	1,2,3	
	2.1	**Relational Algebra**		
		Introduction, Mapping the ER and EER Model to the Relational Model , Data Manipulation , Data Integrity , Relational Algebra , Relational Algebra Queries, Relational Calculus.		05
	2.2	**SQL**		
		Overview of SQL, Data Definition Commands, Set operations, aggregate function, null values, , Data Manipulation commands, Data Control commands , Views in SQL, Nested and complex queries ,PL/SQL		10
3		**Relational database design**	1,2,3	03
	3.1	**Integrity and Security in Database**		
		Domain Constraints, Referential integrity, Assertions, Trigger,		

		Security, and authorization in SQL,		
		Normalization		05
	3.2	Design guidelines for relational schema, Functional dependencies, Normal Forms- 1NF, 2 NF, 3NF, BCNF and 4NF		
4		**Transaction Processing**	1,2,3	
	4.1	**Transactions Management**		
		Transaction concept, Transaction states, ACID properties, Implementation of atomicity and durability, Concurrent Executions, Serializability , Recoverability, Implementation of isolation, Concurrency Control: Lock-based ,Timestamp-based , Validation-based protocols, Deadlock handling,		05
	4.2	Recovery System		
		Failure Classification, Storage structure, Recovery and atomicity, Log based recovery, Shadow paging.		03
			Total	**39**

References:
[1] Korth, Slberchatz, Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill
[2] Elmasri and Navathe, "Fundamentals of Database Systems", 5th Edition, PEARSON Education.
[3] G. K. Gupta :"Database Management Systems", McGraw – Hill.
[4]Peter Rob and Carlos Coronel, "Database systems Design, Implementation and Management", Thomson Learning, 5th Edition.
[5] Raghu Ramkrishnan and Johannes Gehrke , "Database Management Systems", TMH