Course Code	18CSC303J	Course Name	DATABASE MANAGEMENT SYSTEMS	Course Category	C	Professional Core	L	T	P	C
							3	0	2	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Science and Engineering		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	Understand the fundamentals of Database Management Systems, Architecture and Languages
CLR-2 :	Conceive the database design process through ER Model and Relational Model
CLR-3 :	Design Logical Database Schema and mapping it to implementation level schema through Database Language Features
CLR-4 :	Familiarize queries using Structure Query Language (SQL) and PL/SQL
CLR-5 :	Familiarize the Improvement of the database design using normalization criteria and optimize queries
CLR-6 :	Understand the practical problems of concurrency control and gain knowledge about failures and recovery

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:
CLO-1 :	Acquire the knowledge on DBMS Architecture and Languages
CLO-2 :	Apply the fundamentals of data models to model an application's data requirements using conceptual modeling tools like ER diagrams
CLO-3 :	Apply the method to convert the ER model to a database schemas based on the conceptual relational model
CLO-4 :	Apply the knowledge to create, store and retrieve data using Structure Query Language (SQL) and PL/SQL
CLO-5 :	Apply the knowledge to improve database design using various normalization criteria and optimize queries
CLO-6 :	Appreciate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.

Program Learning Outcomes (PLO)

	Learning			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	LevelOfThinking (Bloom)	ExpectedProficiency (%)	ExpectedAttainment (%)	EngineeringKnowledge	Problem Analysis	Design&Development	Analysis,Design,Research	ModernToolUsage	Society&Culture	Environment&Sustainability	Ethics	Individual & TeamWork	Communication	ProjectMgt&Finance	LifeLongLearning	PSO-1	PSO-2	PSO-3
CLO-1	3	80	70	H	M	L	L	-	-	-	-	L	L	L	H	H	-	-
CLO-2	3	85	75	H	H	H	H	H	-	-	-	H	H	H	H	H	-	-
CLO-3	3	75	70	H	H	H	H	H	-	-	-	H	H	H	H	H	-	-
CLO-4	3	85	80	H	H	L	M	L	-	-	-	M	M	M	L	H	-	-
CLO-5	3	85	75	H	L	L	L	L	-	-	-	M	L	L	L	L	-	-
CLO-6	3	85	75	H	L	L	L	L	-	-	-	H	L	L	L	L	-	-

Duration (hour)		15	15	15	15	15
S-1	SLO-1	What is Database Management System	Database Design	Basics of SQL-DDL,DML,DCL,TCL	Relational Algebra – Fundamental Operators and syntax, relational algebra queries, Tuple relational calculus	Transaction concepts, properties of transactions,
	SLO-2	Advantage of DBMS over File Processing System	Design process	Structure Creation, alternation		serializability of transactions,
S-2	SLO-1	Introduction and applications of DBMS	Entity Relation Model	Defining Constraints-Primary Key, Foreign Key, Unique, not null, check, IN operator		testing for serializability, System recovery,
	SLO-2	Purpose of database system		Functions-aggregation functions	Pitfalls in Relational database, Decomposing bad schema	Concurrency Control
S-3	SLO-1	Views of data	ER diagram			
	SLO-2			Built-in Functions-numeric, date, string functions, string functions, Set operations,	Functional Dependency – definition, trivial and non-trivial FD	
S	SLO-1	Lab 1: SQL Data Definition Language Commands on sample exercise	Lab4 : Inbuilt functions in SQL on sample exercise.	Lab 7 : Join Queries on sample exercise.	Lab10: PL/SQL Procedures on sample exercise.	Lab 13: PL/SQL Exception Handling
4-5	SLO-2	* The abstract of the project to construct database must be framed	* Frame and execute the appropriate DDL,DML,DCL,TCL for the project	* Frame and execute the appropriate Join Queries for the project	* Frame and execute the appropriate PL/SQL Procedures and Functions for the project	* Frame and execute the appropriate PL/SQL Procedures and Functions for the project
S-6	SLO-1	Database system Architecture	Keys , Attributes and Constraints	Sub Queries, correlated sub queries	closure of FD set, closure of attributes	Two- Phase Commit protocol, Recovery and Atomicity
	SLO-2				irreducible set of FD	
S-7	SLO-1	Data Independence	Mapping Cardinality	Nested Queries, Views and its Types	Normalization – 1NF, 2NF, 3NF,	Log-based recovery
	SLO-2					
S-8	SLO-1	The evolution of Data Models	Extended ER - Generalization,	Transaction Control Commands	Decomposition using FD- dependency	concurrent executions of transactions and

	SLO					
	SLO-2		Specialization and Aggregation	Commit, Rollback, Savepoint,	preservation,	related problems
S 9-10	SLO-1	Lab 2: SQL Data Manipulation Language Commands	Lab 5: Construct a ER Model for the application to be constructed to a Database	Lab 8: Set Operators & Views.	Lab 11: PL/SQL Functions	Lab 14: PL/SQL Trigger
	SLO-2	*Identification of project Modules and functionality		*Frame and execute the appropriate In-Built functions for the project	*Frame and execute the appropriate Set Operators & Views for the project	*Frame and execute the appropriate PL/SQL Cursors and Exceptional Handling for the project
S-11	SLO-1	Degrees of Data Abstraction	ER Diagram Issues	PL/SQL Concepts- Cursors	BCNF	Locking mechanism, solution to concurrency related problems
	SLO-2		Weak Entity			
S-12	SLO-1	Database Users and DBA	Relational Model	Stored Procedure, Functions Triggers and Exceptional Handling	Multi- valued dependency,	Deadlock
	SLO-2				4NF	
S-13	SLO-1	Database Languages	Conversion of ER to Relational Table	Query Processing	Join dependency and 5NF	two-phase locking protocol, Isolation, Intent locking
	SLO-2					
S 14-15	SLO-1	Lab 3: SQL Data Control Language Commands and Transaction control commands to the sample exercises	Lab 6: Nested Queries on sample exercise	Lab9: PL/SQL Conditional and Iterative Statements	Lab 12: PL/SQL Cursors	Lab 15 : * Frame and execute the appropriate PL/SQL Cursors and Exceptional Handling for the project * Demo of the project
	SLO-2	*Identify the issues that can arise in a business perspective for the application	*Construction of Relational Table from the ER Diagram	*Frame and execute the appropriate Nested Queries for the project	*Frame and execute the appropriate PL/SQL Conditional and Iterative Statements for the project	

Learning Resources	1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts‖, Sixth Edition, Tata McGraw Hill,2011. 2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems‖, Sixth Edition, Pearson Education,2011. 3. C.J Date,A Kannan,S Swarnynathan, An Introduction to Database Systems, Eight Edition, Pearson Education,2006. 4. Rajesh Narang, Database Management Systems, 2nd ed., PHI Learning Private Limited,2011.	4. Martin Gruber, Understanding SQL, Sybex,1990 5. SharadMaheshwari,IntroductiontoSQLandPL/SQL,2ded.,LaxmiPublications,2016. 6. RaghuramaKrishnan,JohannesGehrke,DatabaseManagementSystems,3rdEdition,McGrawHill

Learning Assessment

Bloom's Level of Thinking		Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (15%)		CLA – 3 (15%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember Understand	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
Level 2	Apply Analyze	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Level 3	Evaluate Create	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Total	100 %		100 %		100 %		100 %		-	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, Conf. Paper etc.,

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Dr.Mariappan Vaithilingam, Engineering Leader Amazon, dr.v.m@ieee.org		1. Ms. Sasi Rekha Sankar SRMIST
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