

Course Code	18AIC207J	Course Name	DATABASE MANAGEMENT SYSTEMS FOR ARTIFICIAL INTELLIGENCE	Course Category	C	Professional Core Course				L	T	P	C
										2	0	2	3

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Artificial Intelligence		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning	Program Learning Outcomes (PLO)
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CLR-1 :	Understand the fundamentals of Database Management Systems, Architecture and Languages		1	2	3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Conceive the database design process through ER Model and Relational Model		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
CLR-3 :	Design Logical Database Schema and mapping it to implementation level schema through Database Language																				
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		3	80	70		H	M	L	L	-	-	-	-	L	L	L	H	H	H	H
CLO-2 :	Apply the fundamentals of data models to model an application's data requirements using conceptual modelling tools like ER diagrams		3	85	75		H	H	H	H	H	-	-	-	H	H	H	H	H	H	H
CLO-3 :	Apply the method to convert the ER model to a database schemas based on the conceptual relational model		3	75	70		H	H	H	H	H	-	-	-	H	H	H	H	H	H	H
CLO-4 :	Apply the knowledge to create, store and retrieve data using Structure Query Language (SQL) and PL/SQL		3	85	80		H	H	H	H	H	-	-	-	H	H	H	H	H	H	H
CLO-5 :	Apply the knowledge to improve database design using various normalization criteria and optimize queries		3	85	75		H	H	L	M	L	-	-	-	M	M	M	L	H	H	H
CLO-6 :	Appreciate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures		3	85	75			H	L	L	L	-	-	-	H	L	L	L	H	H	H

Duration (hour)	12	12	12	12	12
S-1	SLO-1	What is Database Management System	ER Diagram Issues	Joins	Query Processing
	SLO-2	Advantage of DBMS over File Processing System	Weak Entity, Relational Model		Multi- valued dependency, 4NF
S-2	SLO-1	Introduction and applications of DBMS	Conversion of ER to Relational Table	Transaction Control Commands	Relational Algebra – Fundamental Operators and syntax, relational
					Transaction concepts, properties of transactions

	SLO-2	Purpose of database system		Commit, Rollback, Save point	algebra queries	Serializability of transactions
S 3-4 (LAB)	SLO-1	Lab 1: SQL Data Definition Language Commands on sample exercise * The abstract of the project to construct database must be framed	Lab 4: Inbuilt functions in SQL on sample Exercise.	Lab 7: Join Queries on sample exercise. * Frame and execute the appropriate DDL,DML,DCL,TCL for the project	Lab 10: PL/SQL Functions	Lab 13:PL/SQL Trigger * Frame and execute the appropriate PL/SQL Cursors and Exceptional Handling for the project
	SLO-2					
S-5	SLO-1	Views of data	Basics of SQL-DDL,DML,DCL,TCL	Stored Procedure	Pitfalls in Relational database, Decomposing bad schema	testing for serial inability
	SLO-2	Data Independence	Structure Creation, alteration		Functional Dependency – definition, trivial and non-trivial FD	System recovery
S-6	SLO-1	Language Commands * Identification of project Modules and functionality	Defining Constraints-Primary Key, Foreign Key, Unique, not null, check, IN operator	Functions Triggers	closure of FD set , closure of attributes	Concurrency Control
	SLO-2		Functions-aggregation functions	Exceptional Handling	irreducible set of FD	Two- Phase Commit protocol
S 7-8 (LAB)	SLO-1	Lab 2: Database Design	Lab 5: Construct a ER Model for the application to be constructed to a Database	Lab 8 :PL/SQL Conditional and Iterative Statements,sets and views * Frame and execute the appropriate Nested Queries for the project	Lab 11: PL/SQL Cursors * Frame and execute the appropriate PL/SQL Conditional and Iterative Statements for the project	Lab 14: Convert postgre database data to CSV and migration of SQL to PostgreSQL PL/SQL
	SLO-2	Entity Relation Model				
S-9	SLO-1	ER diagram	Built-in Functions-numeric, date, string functions, string functions, Set operations.	PostgreSQL Overview	Normalization – 1NF, 2NF, 3NF	concurrent executions of transactions and related problems
	SLO-2		Sub Queries, correlated sub queries	Displaying output as CSV		Locking mechanism, solution to concurrency SLO-2 Weak Entity related problems
S-10	SLO-1	Keys , Attributes and Constraints	Nested Queries	Migrating SQL statements to PostgreSQL	Decomposition using FD- dependency preservation, BCNF	Deadlock
	SLO-2	Mapping Cardinality, Generalization, Specialization and Aggregation	Views and its Types			two-phase locking protocol
S 11-12 (LAB)	SLO-1	Lab 3: SQL Data Control Language Commands and Transaction control	Lab 6: Nested Queries on sample exercise * Construction of Relational Table from the ER Diagram	Lab 9: PL/SQL Procedures on sample exercise. * Frame and execute the appropriate Join Queries for the project	Lab 12: Exception Handling * Frame and execute the appropriate PL/SQL Procedures and Functions for the project	Lab 15: JDBC connectivity with PostgreSQL
	SLO-2	commands to the sample exercises * Identify the issues that can arise in a business perspective for the application				

Learning Resources	<ol style="list-style-type: none"> 1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts, Sixth Edition, Tata McGraw Hill,2019. 2. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems, Sixth Edition, Pearson Education,2015 3. Martin Gruber, Understanding SQL, Sybex,1990 4. Sharad Maheshwari,Introduction to SQLandPL/SQL,2ded.,LaxmiPublications,2016. 5. Hans- Jorgen Schonig, Mastering PostgreSQL 12, Third Edition, PacktPublishing, 2019. 6. Thomas Lockhart, PostgreSQL Programmer's Guide, PostgreSQL Development Team 7. RaghuramaKrishnan,Johannes Gehrke,Database Management Systems,3rdEdition,McGrawHill Education,2003.
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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	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Dr. Mariappan Vaithiyathan, Senior Director of Engineering, Fresh Works.	1. Dr. E. Sivasankar, Assistant Professor, Department of CSE, NIT, Trichy industry	1. Mr. S. Joseph James, SRMIST