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**
Mr. S. Karthik, IT Analyst, Tata Consultancy Services	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	Dr.G.Kalpana
		Mrs.A.Pavithra

Course Code	**USA20401J**	**Course Name**	**DATABASE SYSTEMS**	**Course Category**	**C**	**Professional Core**	**L**	**T**	**P**	**C**
							4	**0**	**4**	**6**

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

		Learning			Program Learning Outcomes (PLO)														
Course Learning Rationale (CLR):	The purpose of learning this course is to:	1	2	3	1	2	3	4	5	6	7	8	9	100	11	12	13	14	15
CLR-1 :	Understand the fundamentals of Database Management Systems, Architecture and Languages	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-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	3	80	70	H	M	L	L	-	-	-	-	L	L	L	H	-	-	-
CLO-2 :	Apply the fundamentals of data models to model an application's data requirements using conceptual modeling tools like ER diagrams	3	85	75	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	3	75	70	H	H	H	H	H	-	-	-	H	H	H	H	-	-	-

	relational model																				
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	-	-	-
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	-	-	-
CLO-6 :	Appreciate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.	3	85	75		H	L	L	L	L	-	-	-	H	L	L	L			

Duration (Hour)		24	24	24	24	24
S-1	SLO-1	What is Database Management System	Design process	Basics of SQL- DDL,DML,DCL,TCL	Decomposition using FD- dependency preservation,	Serializability, Recoverability, Transaction support in SQL
	SLO-2	Advantage of DBMS over File Processing System		Structure Creation, alternation		
S-2	SLO-1	Introduction and applications of DBMS	Entity Relation Model	Defining Constraints-Primary Key, Foreign Key, Unique, not null, check, IN operator	Codd Rules	Concurrent Executions
	SLO-2	Purpose of database system				Concurrency control
S-3	SLO-1	Views of data	ER diagram	Functions-aggregation functions	Normalization – 1Nf, 2NF, 3NF,	Concurrency Control : Lock based Protocols Two Phase Ccontrol Commit Protocol
	SLO-2		Case study for ER Diagram	Built-in Functions-numeric, date, string functions, string functions, Set operations,	BCNF, 4NF and 5NF	
S-4	SLO-1	SQL : Data Definition Commands	Design Issues in ER Model	SQL : Joins	Pl/SQL Introduction	PL/SQL : Query Precessing and Stored Procedure
	SLO-2		SQL : Aggregate Functions		PL/SQL : variable declaration and icontrol structures	
S 5-8	SLO-1	Laboratory 1: SQL Data Definition Language Commands on sample exercise	Laboratory 4 : Inbuilt functions in SQL on sample Exercise.	Laboratory 7 : Join Queries on sample exercise. * Frame and execute the appropriate DDL,DML,DCL,TCL for the project	Laboratory 10: PL/SQL Conditional and Iterative Statements	Laboratory 13: PL/SQL Query Processing , stored procedure
	SLO-2					
S-9	SLO-1	Database system	Keys , Attributes and Constraints	Sub Queries,	Domain Constraints,	Concurrency Control : Time

		Architecture			Referential Integrity	Stamp based
	SLO-2				Secondary Storage Devices	Validation based
S-10	SLO-1	Overview of SQL	Mapping Cardinality	Correlated sub queries	Buffering of blocks	MultiGranularity, Deadlocking,
	SLO-2				File organization	Deadlock Prevention protocol
S-11	SLO-1	SQL : Data Manipulation	Extended ER - Aggregation	Nested Queries, Views and its	Indexing Methods – Primary ,	Recovery Concepts, Deferred
	SLO-2	Commands	Generalizaion and Specialization	Types	Secondary , Multilevel Indices	update technique, Immediate update technique, Shadow paging,
S-12	SLO-1	SQL : Set Operations	SQL : Views in SQL	Transaction Control Commands	ISAM, B-trees Introduction	PL/SQL : Exceptional Handling
	SLO-2		SQL Queries in SQL	Commit, Rollback, Save point		PL/SQL: Trigger
S-13-16	SLO-1	Laboratory 2: SQL Data Manipulation Language Commands * Identification of project Modules and functionality	Laboratory 5: Simple Queries in SQL	Laboratory 8: Sub Queries	Laboratory 11: PL/SQL Functions * Frame and execute the appropriate Set Operators & Views for the project	Laboratory 14: PL/SQL Trigger, Exceptional Handling * Frame and execute the appropriate PL/SQL Cursors and Exceptional Handling for the project
	SLO-2					
S-17	SLO-1	Data Independence	ER Diagram Issues	Relational Algebra – Fundamental Operators and syntax, relational algebra queries	Transaction Management Transaction Concept	Database security and Authorization Need forf Database security
	SLO-2					
S-18	SLO-1	The evolution of Data Models	Weak Entity	Pitfalls in Relational database	Transaction States	Mandatory Access control and Multilevel Security
	SLO-2					
S-19	SLO-1	Comparision of Data Models	Conversion of ER to Relational Table	Functional Dependency – definition,	ACID Properties	Database Users and DBA Statistical database security
	SLO-2					
S-20	SLO-1	SQL : Data Control Commads	SQL : Nested Queries	trivial and non-trivial FD	PL/SQL Cursor	
	SLO-2	SQL:Transaction Control Commands			PL/SQL : Functions and statements to handle Cursor,	PL/SQL : Application Programs
S 21-24	SLO-1	Laboratory 3: SQL Data Control Language Commands and Transaction control commands to the sample exercises * Identify the issues	Laboratory 6: Nested Queries on sample exercise * Construction of Relational Table from the ER Diagram	Laboratory 9: Correlated Subqueries	Laboratory 12: PL/SQL Cursors * Frame and execute the appropriate PL/SQL Conditional and Iterative Statements for the project	Laboratory 15 Student Progress report Generation Employee Payslip generation
	SLO-2					

		that can arise in a business perspective for the application				

Learning Resources	1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, (2011),"Database System Concepts", Sixth Edition, Tata McGraw Hill 2. RamezElmasri, Shamkant B. Navathe,(2011), "Fundamentals of Database Systems", Sixth Edition, Pearson Education 3. CJ Date,AKannan,SSwamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education	5.. Martin Gruber, (1990), "Understanding SQL", Sybex SharadMaheshwari, (2016), "Introduction to SQLandPL/SQL", Second Edition, Laxmi Publications 6. RaghuramaKrishnan,JohannesGehrke, (2003), Database Management Systems, Third Edition,McGrawHill Education

Learning Assessment											
Bloom's Level of Thinking		Continous Learning Assessment(50% Weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		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%	

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Mr. S. Karthik, IT Analyst, Tata Consultancy Services	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1.Mrs.E.Aarthi 2.Mrs.P.Yogalakshmi

Course Code	UMS20402T	Course Name	Resource Management Techniques	Course Category	C	Professional Core Course	L	T	P	C
							4	0	0	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Mathematics and Statistics	Data Book / Codes/Standards		Graph sheet needed	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning	Program Learning Outcomes (PLO)

		1	2	3
CLR-1 :	To provide foundations in Operations Research	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	To apply basic concepts of Linear programming problems			
CLR-3 :	To learn and understand Operations research approach to various applications			
CLR-4 :	To provide a set of algorithms for solving sequencing problems			
CLR-5 :	To employ appropriate methods of Game theory			
CLR-6 :	To have a proper understanding of decision making problems			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Scientific 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
CLO-1 :	To recognize the scope and models of Operations research methods for decision making process.	3	85	80	L	L	L	M	L	-	-	-	L	M	H	M	-	-	-