



**University School of Automation and Robotics**  
**GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY**  
 East Delhi Campus, Surajmal Vihar  
 Delhi - 110092

<b>Paper code : ARI 322T</b>										L	T/P	Credits
<b>Subject : Database Management System</b>										4	0	4
<b>Marking Scheme:</b> Teachers Continuous Evaluation: As per university examination norms from time to time. End Term Theory Examination: As per university examination norms from time to time.												
<b>INSTRUCTIONS TO PAPER SETTERS: Maximum Marks: As per University Norms</b>												
<ul style="list-style-type: none"> <li>➤ There should be 9 questions in the end term examination question paper</li> <li>➤ Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions.</li> <li>➤ Apart from Question No. 1, the rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, students may be asked to attempt only 1 question from each unit.</li> <li>➤ The questions are to be framed keeping in view the learning outcomes of course/paper. The standard/ level of the questions to be asked should be at the level of the prescribed textbooks.</li> <li>➤ The requirement of (scientific) calculators/ log-tables/ data-tables may be specified if required</li> </ul>												
<b>Course Outcomes:</b>												
<b>CO1:</b> Ability of students to understand the basic concepts of Database Management System [K2]												
<b>CO2:</b> Ability of students to the design database schemas and ER Model [K6]												
<b>CO3:</b> Ability of students to understand the concept of transaction management [K1,K2]												
<b>CO4:</b> Ability of students to compare different types of NoSQL Databases and RDBMS with different NoSQL databases [K4]												
<b>Course Outcome to Program Outcomes, Mapping (Scale 1: Low, 2: Medium, 3: High)</b>												
CO/PO	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
CO1	3	3	3	3	1	-	-	-	-	2	3	3
CO2	2	3	3	3	1	1	-	-	-	2	3	3
CO3	2	3	3	3	1	1	-	-	-	2	3	3
CO4	3	3	3	3	1	1	-	-	-	2	2	3
<b>Course Content</b>												<b>No of Lectures</b>
<b>Unit I</b> What is Database System, Purpose of database system, View of data, Relational databases, Database Architecture, Data Models, Transaction Management.												[10]
<b>Unit II</b> Database design and ER Model: Overview, constraint, ERD Issues weak entity sets, Codd rules, relational schemas, Introduction to Unified Modeling Language, Normalization (1NF, 2NF, 3NF, BCNF) Relational Algebra: Introduction, selection and projection, set operation, joins division, Grouping and Ungrouping, Relational Comparison.												[10]
<b>Unit III</b> Transaction Management: ACID properties, Serializability and concurrency control, Lock based												[10]



concurrency control(2PL,Deadlock) Time Stamping Methods, Database Recovery Management	
<b>Unit IV</b> Overview and History of NoSQL Databases, Definition of the Four Types of NoSQL Database, The Value of Relational Databases, Getting at Persistent Data, Concurrency, Integration, The Emergence of NoSQL. Comparison of relational databases to new NoSQL stores, MongoDB, Cassandra, HBASE, Neo4j use and deployment, Application, RDBMS approach, Challenges NoSQL approach, Key-Value and Document Data Models, Column-Family Stores, Aggregate-Oriented Databases. Replication and sharding, MapReduce on databases.	[10]
<b>Text Books:</b> [T1] Sadalage, P. J., & Fowler, M. (2013). NoSQL distilled: a brief guide to the emerging world of polyglot persistence. Pearson Education. [T2] Silberschatz, A., Korth, H. F., & Sudarshan, S. (2002). Database system concepts (Vol. 5). New York: McGraw-Hill. [T3] Elmasri, R., Navathe, S. B., Elmasri, R., & Navathe, S. B. (2000). Fundamentals of Database Systems	
<b>Reference Books:</b> [R1] Date, C. J. (2004). An Introduction to Database Systems. 8-th ed. [R2] Ullman, J. D. (1983). Principles of database systems. Galgotia publications. [R3] Bipin C. Desai. (1990). An Introduction to Database Systems. West Publishing Co.	