Course	Sid to Manual Control	V TO V					Nat				chnology onal Importa	_	nalaya				CURRI	CULUM	
Course   C	P	rogramr	ne Bachelor of Technology in Computer Science and Engineering Year of Regulation														2019-2020		
Course   Course   Course Name   Credit Structure   Marks Distribution																			
Code   Course Name		<u> </u>			•							Credit	Structure			Marks Distribution			
To understand the fundamental components of database, operation of relational data model and its requirement in an organization.  To understand the various relational data models, application of relational data models to design logical database including E-R diagrams and database organization. And also write the simple and optimized advanced database understands are not interestable to design logical database including E-R diagrams and database organization. And also write the simple and optimized advanced database understands of the database understands of SQL. convert the string Structured Query Language (SQL).  To understand the requirement of database understands of SQL. convert the database understands of SQL. convert the fact that the practical understanding of SQL. convert the string structured Query Language (SQL).  To understand the requirement of database understands of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understands of SQL. convert the fact that the practical understands of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL. convert the fact that the practical understanding of SQL.						Co	ourse Nan	ne			L	1	1	С	INT	· ·		1	
Telestonal data model and its requirement in an organization.   CO1   systems, Relational Database Management System and it of the distribution	CS	371			[	Database	System	Concepts	<b>)</b>		2	0	0	2	50	50	100	200	
data models to design logical database including ER diagrams and database ormalization. And also write the simple and optimized advanced database queries using Structured Query Language (SQL).    To develop and ability to design and implement a small database project using Structured Query Language (SQL).   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols and role of database administrator.   To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data database tuning concerns the data using queries.   To understand the requirement of database tuning concept of a database transaction, including concurrency control, data database tuning concerns the data using queries.   To understand the requirement of database tuning concerns to the data base stall database tuning concerns the data using queries.   To understand the requirement of database tuning concerns to the database database tuning concerns the database database tuning concerns to the database dat												CO1	systems, Relational Database Management System and						
Column   C	Co	urse	data models to design logical database including E-R diagrams and database normalization. And also write the simple and optimized advanced database queries using Structured Query Language (SQL).  To develop and ability to design and implement a small database project using Structured Query Language (SQL).  To understand the requirement of database tuning, concept of a database transaction, including concurrency control, data object locking protocols								Course	CO2	Able to demonstrate the Entity Relationship Model, analyse the real world problems and requirements, to give the appropriate solution using the principles of Entity Relationship Diagram.						
To understand the requirement of database turning, concept of a database and relational relational relational relational database administrator.   Section 2016   Section	Obje	ctives									Outcomes	CO3							
Variable concurrency control, data object locking protocols   COS   Able to understand the concurrent transactions, Problem such as fallures, solutions to solve the concurrency problem. Processing protocols.    Note												CO4							
No.   PO1   PO2   PO3   PO4   PO5   PO6   PO7   PO8   PO9   PO10   PO11   PO12   PS01   PS02   PS03												CO5	Able to understand the concurrent transactions, Problems such as failures, solutions to solve the concurrency problems						
PO1   PO2   PO3   PO4   PO5   PO6   PO7   PO8   PO9   PO10   PO11   PO12   PS01   PS02   PS03	NI-	000	Mapping with Program Outc								comes (POs	)	Mapping with PSOs					PSOs	
CO2   3   3   3   1   2   0   0   0   1   0   0   0   2   3   3   3   3   4   CO4   1   2   3   3   3   2   2   0   0   0   0   0   0   0   0	INO.	COS	PC	)1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO2	1	CO1	3	3	3	0	0	0	0	0	0	2	0	0	0	3	0	3	
CO2   CO2   CO3   CO4   CO5   CO4   CO5   CO5   CO5   CO4   CO5	2	CO2	3	3	3	3	1	2	0	0	0	1	0	0	0	2	3	2	
SYLLABUS   SYLLABUS   SYLLABUS	3	CO3	1		2	3	3	2	2	0	0	0	0	0	0	2	3	3	
No.   Content   Hours   COs	4				2	3	3	3	2	3	0	2	0	0	1	2	3	2	
No.   Content   Hours   COs	5	CO5	2	2	3	3	2	2				2	0	0	1	3	3	3	
Introduction to Database: Purpose of database systems, data abstraction and modelling, instances and schemes, database manager, database users and their interactions, data definition and manipulation language, data dictionary, overall system structure.  Entity-relationship model: Entities and entity sets, relationships and relationship sets, mapping constraints, E-R diagram, primary keys, strong and weak entities, reducing E-R diagrams to tables, trees or graphs, generalization and specialization, aggregation.  Relational model: Structure of a relational database, operation on relations, relational algebra, tuple and domain relational calculus, salient feature of a query language, Structured query language: Description an actual RDBMS and  CO4  Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  Co5  Co6  CO7  CO8  CO9  CO9  CO9  CO9  CO9  CO9  CO9		1								SYLLA	BUS						1		
Introduction to Database. Full pose of database systems, data abstraction and modeling, mistances and characteristic problems.   CO2	No.								Content							Hours			
data dictionary, overall system structure.  Entity-relationship model: Entities and entity sets, relationships and relationship sets, mapping constraints, E-R diagram, primary keys, strong and weak entities, reducing E-R diagrams to tables, trees or graphs, generalization and specialization, aggregation.  Relational model: Structure of a relational database, operation on relations, relational algebra, tuple and domain relational calculus, salient feature of a query language, Structured query language: Description an actual RDBMS and SQL.  Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  CO4  CO5  CO4  CO5  CO5  CO5  CO6  CO7  CO7  CO7  CO8  CO9  CO9  CO9  CO9  CO9  CO9  CO9																00		CO1	
Entities and entity sets, relationships and relationship sets, mapping constraints, E-R diagram, primary keys, strong and weak entities, reducing E-R diagrams to tables, trees or graphs, generalization and specialization, aggregation.  Relational model: Structure of a relational database, operation on relations, relational algebra, tuple and domain relational calculus, salient feature of a query language, Structured query language: Description an actual RDBMS and SQL.  Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  CO2  CO3  CO4  CO4  CO5  CO5  CO5  CO5  CO5  CO5	ı	data d	lictiona	ry, o	verall sy	stem stru		rs and th	eir interact	iions,	data definit	ion and	manipuia	ition lang	uage,	02	CO2		
aggregation.  Relational model: Structure of a relational database, operation on relations, relational algebra, tuple and domain relational calculus, salient feature of a query language, Structured query language: Description an actual RDBMS and SQL.  Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  CO4  CO5  CO4  CO5  CO4  CO5  CO5  CO5	II	Entitie	es and	entit	ty sets, r	elationsh										04			
Structure of a relational database, operation on relations, relational algebra, tuple and domain relational calculus, salient feature of a query language, Structured query language: Description an actual RDBMS and SQL.  Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  CO4  CO5  CO4  CO5  CO5  CO5  CO5  CO6  CO7  CO7  CO7  CO7  CO8  CO9  CO9  CO9  CO9  CO9  CO9  CO9		aggre	gation.																
Normalization: Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.  V Concurrency Control in RDBMS: Testing for serializability, lock based and time-stamp based protocols; Deadlock detection and Recovery  CO4  CO4  CO5	III	Struct calcul	ture of	a r	elational														
Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF, limitations of RDBMS.    V   Concurrency Control in RDBMS:																		CO4	
V Concurrency Control in RDBMS: Testing for serializability, lock based and time-stamp based protocols; Deadlock detection and Recovery  06 CO5	IV	Pitfalls in RDBMS, importance of normalization, functional, multi-valued and join dependencies, 1NF to 5NF,														05			
	V	Conc	urrency	/ Con	ntrol in RI		ed and ti	me-stamn	hased nro	otocol	ls: Deadlock	detecti	on and Re	acoverv		06		CO4	
		1 620	ing ioi s	oci ial	nzaviilly,	וטטה שמט	cu anu ti	•			is, Deaulock	uelett	on and Re	- COVEIY		24		CUS	

## **Essential Readings**

- 1. Silberschatz, Korth and Sudarshan, Database system concepts, McGraw Hill, 7th Edition, 2019.
- 2. C.J. Date, An Introduction to Database Systems (8th Edition), Pearson, 8th Edition, 2004.
- 3. Steven Feuerstein, Bill Pribyl, "Oracle PL/SQL Programming,", O'Reilly Media, 6th Edition, 2014.

## **Supplementary Readings**

- 1. Elmasri and Navathe, Fundamentals of database systems; Pearson, 7th Edition, 2016.
- 2. Raghu Ramakrishnan and Gehrke, Database Management System, McGraw-Hill, 3rd Edition, 2014.
- 3. C. J. Date, SQL and Relational Theory: How to Write Accurate SQL Code, O'Reilly Media, 3rd Edition, 2015.