

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Pract.	Tut.	Theory	TW/Pract	Tut.	Total
SEITC305	Database Management System	03	02	--	03	01	--	04

Sub. Code	Subject Name	Examination Scheme								
		Theory Marks				End Semester Exam	TW	Pract.	Oral	Total
		Internal Assessment			Avg. of Test1 & Test2					
SEITC305	Database Management System	Test 1	Test 2							
		20	20	20	80	25	25	-	150	

### Objective:

- Learn and practice data modeling using the entity-relationship and developing database designs.
- Understand the use of Structured Query Language (SQL) and learn SQL syntax.
- Apply normalization techniques to normalize the database
- Understand the needs of database processing and learn techniques for controlling the consequences of concurrent data access.

### Outcome: The student should be able:

- To describe data models and schemas in DBMS
- To understand the features of database management systems and Relational database.
- To use SQL- the standard language of relational databases.
- To understand the functional dependencies and design of the database.
- To understand the concept of Transaction and Query processing.

### Detailed Syllabus:

Module	Detailed content	Hours
1	<b>Introduction Database Concepts:</b> Introduction, Characteristics of databases, File system V/s Database system, Users of Database system, Concerns when using an enterprise database, Data Independence, DBMS system architecture, Database Administrator,	02
2	<b>Entity-Relationship Data Model :</b> Introduction, Benefits of Data Modeling, Types of Models, Phases of Database Modeling, The Entity-Relationship (ER) Model, Generalization, Specialization and Aggregation, Extended Entity-Relationship (EER) Model.	03
3	<b>Relational Model and Algebra :</b> Introduction , Mapping the ER and EER Model to the Relational Model , Data Manipulation , Data Integrity ,Advantages of the	06

	Relational Model, Relational Algebra , Relational Algebra Queries, Relational Calculus.	
4	<b>Structured Query Language (SQL)</b> : Overview of SQL , Data Definition Commands, Set operations , aggregate function , null values, , Data Manipulation commands, Data Control commands , Views in SQL, Nested and complex queries .	06
5	<b>Integrity and Security in Database:</b> Domain Constraints, Referential integrity, Assertions, Trigger, Security, and authorization in SQL	04
6	<b>Relational–Database Design</b> : Design guidelines for relational schema, Function dependencies, Normal Forms- 1NF, 2 NF, 3NF, BCNF and 4NF	04
7	<b>Transactions Management and Concurrency:</b> Transaction concept, Transaction states, ACID properties, Implementation of atomicity and durability, Concurrent Executions, Serializability, Recoverability, Implementation of isolation, Concurrency Control: Lock-based , Timestamp-based , Validation-based protocols, Deadlock handling, Recovery System: Failure Classification, Storage structure, Recovery & atomicity, Log based recovery, Shadow paging.	06
8	<b>Query Processing and Optimization: Overview</b> ,Issues in Query Optimization ,Steps in Query Processing , System Catalog or Metadata, Query Parsing , Query Optimization, Access Paths , Query Code Generation , Query Execution , Algorithms for Computing Selection and Projection , Algorithms for Computing a Join , Computing Aggregation Functions , Cost Based Query Optimization .	05

### Text Books:

1. G. K. Gupta :”Database Management Systems”, McGraw – Hill.
2. Korth, Slberchatz,Sudarshan, :”Database System Concepts”, 6th Edition, McGraw – Hill
3. Elmasri and Navathe, “ Fundamentals of Database Systems”, 5thEdition, PEARSON Education.
4. Peter Rob and Carlos Coronel, “ Database Systems Design, Implementation and Management”, Thomson Learning, 5th Edition.

### Reference Books :

1. Dr. P.S. Deshpande, SQL and PL/SQL for Oracle 10g,Black Book, Dreamtech Press
2. Mark L. Gillenson, Paulraj Ponniah, “ Introduction to Database Management”,Wiley
3. Sharaman Shah ,”Oracle for Professional”, SPD.
4. Raghu Ramkrishnan and Johannes Gehrke, “ Database Management Systems”,TMH
5. Debabrata Sahoo “Database Management Systems” Tata McGraw Hill, Schaum’s Outline

**Term Work:**

Assign a case study for group of 2/3 students and each group to perform on their case study following experiments-

- 1) Problem Definition and draw ER /EER diagram
- 2) Design Relational Model
- 3) Perform DDL operation
- 4) PL/SQL
- 5) Perform DML and DCL operations
- 6) Executes- Assertions, Trigger,
- 7) Implementation ACID properties
- 8) Draw Query tree
- 9) Estimate cost of query

**Laboratory Syllabus:**

- 1) Problem Definition and draw ER /EER diagram
- 2) Design Relational Model
- 3) Perform DDL operation
- 4) PL/SQL
- 5) Perform DML and DCL operations
- 6) Executes- Assertions, Trigger,
- 7) Implementation ACID properties
- 8) Draw Query tree
- 9) Estimate cost of query

**Tools used:**

Oracle, DB2, MY SQL or any other open source tools.

**Theory Examination :**

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus wherein sub questions of 2 to 3 marks will be asked.
- Remaining question will be randomly selected from all the modules.

Weightage of marks should be proportional to number of hours assigned to each module.