Course Plan

1. Scope & Objectives of the Course

The course provides a wide scope of learning & understanding of the subject and the main objectives of the course are:

- To provide a comprehensive foundation for designing and implementing database system by using RDBMS and analyse its need for real life applications.
- To enable the students to participate in the development process by implementing SQL commands and be able to describe relational algebraic expression from queries.
- To recognize and identify the use of normalization and functional dependency used in database design.
- To apply and relate the concept of transaction, concurrency control, security and recovery in database.
- To provide knowledge about the concepts of sequence, triggers, cursor, function, procedure, package.

2. Course Learning Outcomes

Student should be able:

	Course Outcome	POs	CL	KC	Sessions
CLO01	To provide a comprehensive foundation for designing and implementing database system by using RDBMS and analyse its need for real life applications.	PO2,PO3,PO11,PO12	K2	Factual Conceptual	**8**
CLO02	To enable the students to participate in the development process by implementing SQL commands and be able to describe relational algebraic expression from queries.	PO2,PO3,PO4,PO12	K3	Procedural Conceptual	**14**
CLO03	To recognize and identify the use of normalization and functional dependency used in database design.	PO1,PO2,PO3,PO12	K3	Conceptual Procedural	**14**
CLO04	To apply and relate the concept of transaction, concurrency control, security and recovery in database.	PO3,PO5,PO12	K3	Conceptual Procedural	**12**
CLO05	To provide knowledge about the concepts of sequence, triggers, cursor, function, procedure, package.	PO1,PO2,PO3,PO10,PO11, PO12	K3	Conceptual Procedural	**12**

Course Plan

3. Recommended Books:

B01: Database System Concepts', Abraham Silberschatz, Henry F. Korth, Sudharsan, McGraw-Hill, Seventh Edition.

B02: 'An Introduction to Database Systems', C.J.Date , O'Reilly Media, Eighth Edition.

B03: 'Database Systems', Ramez.Z.Elmasri, Shamkant B.Navathe, Pearson Education, Seventh Edition.

B04: Introduction to SQL by Oracle Press.

B05: Introduction to PL/SQL by Ivan Bayross, BPB Publications, Fourth Edition

B06: Database Management System, Raghu Ramkrishnan, Johannes Gehrke, McGraw-hill, Third Edition.

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4. Other readings and relevant websites:

Serial No	Link of Journals, Magazines, websites and Research Papers
1.	https://dl.acm.org/doi/pdf/10.5555/77708
2.	https://link.springer.com/chapter/10.1007/978-1-349-11552-5_1
3.	https://www.sciencedirect.com/science/article/pii/B9780934613538500091
4.	https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.444.3426&rep=rep1&type=pdf
5.	https://www.db-book.com/db7/
6.	http://index-of.es/Rdbms/McGraw.Hill.Osborne.Media.Oracle.Database.11g.The.Complete.Reference.Dec.2008.e Book-DDU.pdf
7.	https://community.oracle.com/mosc/discussion/2956726/pl-sql-programming-language-of-oracle-by-ivan-bayross
8.	https://nptel.ac.in/courses/106/106/106106093/
9.	https://dl.acm.org/doi/abs/10.1145/7239.7266

5. Recommended Tools and Platforms

Oracle 11g Express Edition

6. Course Plan:

Session No.	Topic(s)	Recommended Book / Other reading material	Total Sessions
1-4	**Introduction to Databases:** Overview of Database, Database Management System (DBMS), DBMS Architecture, Data Independence, Integrity Constraints	BO1 BO2 Link 6 Link 7	4
5-8	**Data Models:** Data Models, Relational Model, ER Model, ER Diagram, Relational Model	BO1 BO2 BO5	4
9-16	**Functional Dependencies and Normalization:** Functional Dependencies, Normalization: Functional Dependencies, Decomposition Full Functional Dependency (FFD), Transitive Dependency, Normal Forms: 1NF, 2NF Normal Forms: 3NF, BCNF, De-Normalization	BO1 BO2 BO5 Link 5 Link 6 Link 9	8
17-24	**SQL Queries:** DDL statements Create, Alter, Drop , DML statements Insert, Update, Delete, Simple queries WHERE Clause, Compound WHERE Clause with multiple AND & OR Conditions Joins, Sub-queries - Simple & Correlated Using IN, EXISTS, NOT EXISTS, DCL statement Grant, Revoke	BO1 BO2 BO5	8
25-26	**Database Security:** Database Security: Introduction, Threats, Counter Measures	BO1 B06	2
27-36	**Control Structures:** Control Structures: Introduction To Conditional statement, Iterative Control Sequential Control Statements, Cursors, Views	BO3 BO4 Link 8	10

37-48	**Package, Procedures and Triggers:** Procedures, Parts Of Procedures, Parameter Modes, Advantages Of Procedures Triggers: Syntax For Creating Triggers Types Of Triggers Package, Package Specification And Package Body Developing A Package, Bodiless Package, Advantages	BO1 BO2 Link 8	12
49-54	**Transaction Management and Concurrency Control:** Transaction Management, Concurrency Control: Introduction To Transaction, Properties Of Transactions Serializability And Recoverability, Need For Concurrency Control, Locking Techniques	BO1 BO2 Link 7 Link 9	6
55-60	**Database Recovery:** Database Recovery Of Database: Introduction, Need For Recovery, Types Of Errors Recovery Techniques	BO1 BO2 BO6 Link 6 Link 7	6

7. Delivery/Instructional Resources

Lecture No.	Topics	Web References	Audio-Video
1-2	Introduction to Databases: Database Concepts, Characteristics of Data Base approach, Advantages and Disadvantages of DBMS.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106104135
3	Overview of Database Languages and Architectures:Data Independence, DBA and Responsibilities of DBA, Schemas, Instances, Schema architecture	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106106220
4	Data Base System Architecture (Two-tier, Three Level ANSI-SPARC Architecture)	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106105175
5-6	Data Models: Relational Model, ER Model: Design, issues, Mapping constraints, ER diagram, Comparison of Models.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106106220

7-8	Conceptual Data Modelling using Entities and Relationships: Database design process, Entity Types, Entity sets, Attributes, keys And their types, Weak entity types, ER diagrams, naming convention and design issues.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106106220 https://nptel.ac.in/courses/106106220
9-10	Functional dependencies, Decomposition, Full Functional Dependency (FFD), Transitive Dependency (TD)	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106106220
11-16	Normalization: Normal Forms (1NF, 2NF) Normal Forms (3NF, BCNF)	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106104135 https://nptel.ac.in/courses/106104135 https://nptel.ac.in/courses/106104135
17-24	Introduction to PL/SQL: Introduction to PL/SQL basic, environment, Data Types, Variables, operators.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://www.c-sharpcorner.com/article/plsql-for-beginners/
25-26	Database Security, Threats, Counter Measures.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://www.digimat.in/nptel/courses/video/106105175/L01.html
27-36	Control Structures: Introduction to conditional control, Iterative control and sequential control statements.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://www.c-sharpcorner.com/article/plsql-for-beginners/
37-40	Introduction to Functions and Cursors	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://www.c-sharpcorner.com/article/plsql-for-beginners/
41-48	Procedure, Packages and Triggers: Parts of procedures, Parameter modes, Advantages of procedures, package specification and package body, developing a package, Advantages of packages.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://www.c-sharpcorner.com/article/plsql-for-beginners/
49-51	Introduction to Triggers, advantages of triggers, Syntax for creating triggers, Types of triggers.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://freevideolectures.com/course/3684/oracle-11g-12c/40
52	Transaction Management: Introduction to Transaction Processing, Properties of Transactions, Sates of transactions, Schedule.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://onlinecourses.nptel.ac.in/noc21_cs04/preview

53-54	Serializability, Conflict schedule, View Serializability and Recoverability	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106104135
55-56	Concurrency Control: Need for Concurrency Control, Locking Techniques, Time Stamping Methods.	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106106220 https://nptel.ac.in/courses/106104135
57-60	Database Recovery of database: Introduction, Need for Recovery, Types of errors, Recovery Techniques	https://drive.google.com/drive/folders/15AHZkkEkPkMpcOTuX3WRAFv2twAa-A_b?usp=drive_link	https://nptel.ac.in/courses/106104135

8. Action plan for different types of learners

Slow Learners	Average Learners	Advanced Learners
• Remedial Class for slow learners. • Encouragement for improvement using peer tutoring. • Individual feedback to each slow learner.	• Doubt Class for average learners • Special Doubt session will be arranged for ST topics. • Doubts of individual student will be resolved.	• Academic Courses would be provided to fast learner. .

9. Syllabus of the Course:

SNo.	Topic	No. of Lectures	Weightage %
1	Overview of Database, Database Management System (DBMS) DBMS Architecture, Data Independence, Integrity Constraints	4	13.4%
	Data Models, Relational Model, ER Model ER Diagram, Relational Model	4	
2	Functional Dependencies, Normalization: Functional Dependencies, Decomposition Full Functional Dependency (FFD), Transitive Dependency, Normal Forms: 1NF, 2NF Normal Forms: 3NF, BCNF, De-Normalization	8	26.6%
	DDL statements Create, Alter, Drop , DML statements Insert, Update, Delete, Simple queries WHERE Clause,	8	

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	Compound WHERE Clause with multiple AND & OR Conditions, Joins, Sub-queries - Simple & Correlated Using IN, EXISTS, NOT EXISTS, DCL statement Grant, Revoke		
3	Database Security: Introduction, Threats, Counter Measures	2	20%
	Control Structures: Control Structures: Introduction To Conditional statement, Iterative Control Sequential Control Statements, Cursors, Views	10	
4	Package, Procedures and Triggers Procedures, Parts Of Procedures, Parameter Modes, Advantages Of Procedures Triggers: Syntax For Creating Triggers, Types Of Triggers, Package, Package Specification And Package Body, Developing A Package, Bodiless Package, Advantages	12	20%
5	Transaction Management and Concurrency Control: Transaction Management, Concurrency Control: Introduction To Transaction, Properties Of Transactions Serializability And Recoverability, Need For Concurrency Control, Locking Techniques	6	10%
6	Database Recovery: Database Recovery Of Database: Introduction, Need For Recovery, Types Of Errors Recovery Techniques	6	10%