Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2020-2021

Course Handout Part II

Date: 16-01-2021

In addition to Part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CS F212
Course Title : Database Systems
Instructor-in-Charge : R. Gururaj (gururaj@hyderabad.bits-pilani.ac.in)
Instructors : Lov Kumar , Subhrakanta panda, Jabez Christopher, Sandeep
PhD TAs : Gourish G, Lalitha, Simran

Scope:

The scope of this course includes- Data modeling, database design theory, data definition and manipulation languages, relational data model, relational algebra and relational calculus, SQL, functional dependencies and normalization, storage and indexing techniques, query processing and optimization, transaction management - concurrency control and crash recovery.

Course Objectives:

- To Enrich the skill and competency of students in Modeling and Design of relational Database Systems using ER modeling technique.
- To learn Formal and Commercial query languages like- Relational Algebra and SQL for Relational data.
- To Impart practical knowledge in SQL and PL-SQL with hands on experience.
- To make students Industry ready in the field of Database Systems.

Textbooks:

T1. Elmarsi R, & Navathe S B, ***Fundamental of Database System,*** Sixth Edition, Pearson Education.

Reference books:

R1. Silberschatz, Abraham, Henry F. Korth & S.Sudarshan, Database System Concepts McGRAW-HILLS, 6th ed., 2010.

R2. Ramakrishna R. & Gehrke J, ***Database Management Systems***, 3e, Mc-Graw Hill, 2003.

Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Chapter in the Text Book
1-2	To get the context for this course and introduction to basic concepts of Database Systems	Introduction to Database System Concepts – data models ; architecture; components of DBMS.	T1-Ch.1&2; Class Notes
3-5	To understand the essence of Relational data model.	Relational Data Model concepts; Constraints.	T1-Ch.3
6-10	To learn and practice	SQL – DDL and DML Commands	T1-Ch.4 &5

	SQL query operations		
11-14	To understand the Formal query language operations for relational model.	Formal QLs for Relational Model; Relational Algebra; Operations; introduction to Tuple Relational Calculus(TRC).	T1-Ch.6
15-17	To learn modeling Databases at Conceptual level	Database Design by ER-and EER; Mapping from ER/EER to-Relational Schema	T1-Ch. 7, 8
18-22	To understand the basics of database design concepts	Relational Database Design: Functional Dependencies and Normalization , Decomposition rules	T1-Ch. 15
23-25	To understand Data storage mediums and File organization for databases	Disk Storage, File/Record organization	T1-Ch.16
26-30	To learn Hashing and Indexing schemes for Database Systems	Indexing- Primary; Secondary; multilevel; B+ Trees . Hashing – Static and Dynamic hashing Schemes	T1-Ch. 16 & 17
31-32	To understand the Transaction Model	Transaction Processing – States; Schedules	T1- Ch.20
33-35	To understand concurrency control mechanisms	Concurrency Control Techniques – Lock-based and Timestamp based schemes	T1-Ch.21
36-37	To learn the fundamentals of Database recovery Techniques	Database Recovery Techniques- Log-based and Shadow paging schemes	T1- Ch.22
38-41	To understand the basics of SQL Query Processing and Optimization and Database tuning	Query Processing & Optimization- Query trees and Optimization Heuristics; Database tuning strategies	T1- Ch.18, 19
42		Conclusion	

Evaluation Scheme:

S No	Evaluation Component	Weightage	Date & Time	Nature of Component
1	Mid-semester Test	35%	03/03 1.30 - 3.00PM	Open Book
2	Lab Test (post-midsem)	10%	TBA	Open Book
3	Mini project (will have two spells of evaluation)	5% before midsem grading	TBA	Open Book(take-home)
		10% after-midsem grading	TBA	Open Book(take-home)
4	Comprehensive Exam	40 %	08/05 AN	Open Book

Make-up-Policy:

As per the specific guidelines from AUGSD, the General Requirement for Students is as follows.
"It is expected that each student shall acquire a computer with the desired hardware, software along with an internet connection. High-speed broadband access is highly recommended for the optimal learning experience". Hence it is the responsibility of the student to take care of necessary things to take the evaluation components online. Do not ask for makeup on reasons like- HW/Internet/BW related issues. No make-up is possible without prior permission of the IC. Make-up request may be considered only for cases - where hospitalization of the student is done and, on submission of discharge note issued by the hospital authorities, after thorough scrutiny.

Course Notices: All notices pertaining to this course will be put on the **CMS** and/or **Google Classroom** - Course web-page.

Chamber Consultation: Since it is online mode of instruction, the doubt clarification slot will be announced once the course starts, depending on the need, after discussing with students.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-In-charge
Prof. R Gururaj