****

**SECOND SEMESTER 2021-22**

# Course Handout Part II

Date: 15.01.2022

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. : CSF212

## Course Title : Database Systems

Instructor-in-Charge : Dr. Lov Kumar

Instructors : Dr. Manik Gupta, Dr. Subhrakanta Panda, and Dr. D V N Siva Kumar

**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 PLSQLwith 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*,** 7e, Pearson, 2016.

**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 and Class Notes |
| 3 | To understand the essence of Relational data model. | Relational Data Model concepts; Constraints. | T1-Ch.5 |
| 4-11 | To understand the basics of database design concepts | Relational Database Design: Functional Dependencies and Normalization , Decomposition rules | T1-Ch. 14 & 15 |
| 12-15 | To learn modeling Databases at Conceptual level | Database Design by ER-and Extended ER;  Mapping from ER/EER to-Relational Schema | T1-Ch.3, 4 & 9 |
| 16-19 | 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.8 |
| 20-22 | To understand Data storage mediums | Disk Storage | T1-Ch.16 |
| 23-30 | 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 |
| 31-33 | To understand the Transaction Model | Transaction Processing – States; Schedules | T1- Ch.20 |
| 34-36 | To understand concurrency control mechanisms | Concurrency Control Techniques – Lock-based and Timestamp based schemes | T1-Ch.21 |
| 37-39 | To learn the fundamentals of Database recovery Techniques | Database Recovery Techniques- Log-based and Shadow paging schemes | T1- Ch.22 |
| 40 | To learn and practice SQL query operations | SQL – DDL and DML Commands | T1-Ch.6 |
| 41 | To understand Advanced SQL features | Advanced SQL- Stored Procedures; Triggers; Functions | T1-Ch.7 |
| 42 |  | Conclusion |  |

**Evaluation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Component** | **Duration** | **Nature of Component** | **Date & Time** | **Weightage** |
| Mid-semester Exam | 90 Mins. | Closed Book | 16/03 9.00am to10.30am | 25% |
| Quiz-1 | 20 Mins. | Open Book | Feb-2021 | 5% |
| Quiz-2 | 20 Mins. | Open Book | Apr-2021 | 5% |
| Mini-project / Home Asst. (with viva) |  | Open Book | Will be announced in the March 2021 and evaluation in April (tentative) | 15% |
| Lab Exam 1 | 1 Hr. | Open Book | TBA | 5% |
| Lab Exam 2 | 1 Hr. | Open Book | TBA | 5% |
| Comprehensive Exam | 120 min | Closed Book | 19/05 FN | 40% |

***Note: 40% of the evaluation to be completed by midsem grading.***

***"For Comprehensive exam and Mid-semester Test, the mode (offline/online) and the duration are subject to changes as decided by the AUGSD/Timetable division in future."***

**6. Make-up Policy**

For genuine reasons other than medical, prior approval from the IC is mandatory. Requests coming after the test will not be honored. For make-up on medical grounds, first inform the warden about the illness and take his help for consulting the doctor, and finally Chief Hostel Warden’s recommendation is a must and such students should not leave the campus during Test dates (please refer to the guidelines by ID in this regard). No make-up will be given by just producing some medical prescription. The above mentioned rules will be followed very strictly.

**7. Course Notices**

All notices pertaining to this course will be displayed on the CS&IS, and google classroom.

**8. Chamber Consultation:** To be announced.

9. **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**

**CS F212**