KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
(Deemed to be University)
SCHOOL OF COMPUTER ENGINEERING

Subject: DATABASE MANAGEMENT SYSTEMS,
Code: CS-2004, Credit-4
Spring Semester 2020-21
Day wise course coverage
Faculty: Mrs. Adyasha Dash

Lecturer	Date	Topics to be covered
Introduction		
1		Introduction to database systems; Characteristics of databases
2		File system V/s Database system
3		Users of Database system
4		approaches to building a database
5		data models, database management system
6		Data Independence
7		DBMS system architecture, challenges in building a DBMS
8		various components of a DBMS.
9		Tutorial/ Revision
E/R Model		
10		Conceptual Data Modeling – motivation
11		entities, entity types, various types of attributes
12		relationships, relationship types,
13		Entity set types, Participation constraints,
14		E/R diagram notation,
15		Extended E/R Model
16		ER and Extended E/R model Examples
17		ER and Extended E/R model Examples
18		Tutorial/ Revision
Relational Data Model		
19		Concepts of relations,
20		schema-instance distinction, keys,
21		referential integrity & foreign keys
22		converting the database specification in E/R notation to the relational schema,
23		**Relational algebra operators:** selection, projection, cross product
24		**Relational algebra operators:** various types of joins, division,set operations
25		tuple relational calculus,
26		domain relational calculus
27		Fundamentals of SQL
Relational Database Design:		
28		Importance of a good schema design, problems encountered with bad schema designs, motivation for normal forms,
29		dependency theory - functional dependencies,

30		Armstrong's axioms for FD's,
31		closure of a set of FD's, minimal covers,
32		Normalization, Normal Forms - 1NF, 2NF, 3NF and BCNF,
33		Normalization, Normal Forms - 3NF and BCNF,
34		decompositions and desirable properties of them, multi-valued dependencies and 4NF
35		join dependencies and 5NF, Concept of Denormalization.
36		Tutorial/ Revision
Transaction Processing		
37		Transaction processing and Error recovery - Concepts of transaction processing
38		ACID properties
39		concurrency control
40		Serializability
41		locking based protocols,
42		Timestamp based protocols,
43		recovery and logging methods.
Data Storage & Indexing		
44		Data Storage and Indexes - File organizations,
45		primary, secondary index structures,
46		various index structures – hash-based, dynamic hashing techniques, multi-level indexes,
47		B and B+ trees.
48		Tutorial/ Revision
Revision and Preparation for End Semester		