

**KARATINA UNIVERSITY**  
**SCHOOL OF PURE AND APPLIED SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATICS**  
LECTURER: ZABLON OKARI MOBILE: 0725242180  
COM 213: DATABASE SYSTEMS

### **1.0 COURSE PURPOSE**

In this course the learners are exposed to the various forms, types and models of database systems to enable them make viable choices. Supportive and complimentary concepts of managing data and documents are thoroughly examined to give a wholesome view of data/information management. The ultimate aim is to encourage the usage of database management systems for effective data management.

### **2.0 COURSE LEARNING OUTCOMES**

By the end of this course, the learner will be able to:

- i. explain the principles underlying database systems,
- ii. identify characteristics that distinguish the database approach from traditional file processing applications ,
- iii. define relational database models,
- iv. design a database and basic storage structures use a query language

### **3.0 COURSE OUTLINE**

WEEK	TOPIC	SUBTOPICS	METHODOLOGY	COMPETENCIES
1	Overview of database systems	Traditional file processing applications Types of database systems Advantages and disadvantages Database system environment	-Lectures -Class discussions	-Analytical skills
2	Database architecture and Integration	Data independence Components of DBMS	-Lectures -Class discussions -Video demonstrations	-Analytical skills -Creative thinking skills
3	Typical DBMS functions <b>ASSIGNMENT I</b>	Overall system structure Database Lifecycle	-Lectures -Class discussions	-Analytical skills -Problem solving skills
4	Conceptual data model	Types of data models ER model Type of relationships Referential integrity	-Class discussions -Lectures	-Analytical skills
5	Data Normalization <b>CAT I</b>	Advantages and disadvantages of	-Lectures -Class discussions	-Problem solving skills

		Normalization	-CAT ONE	Team work
6	SQL Relational Database	Relational on Data structure Introduction to SQL Referential Integrity options	-Lectures -Class discussions	-Analytical skills -Creative thinking skills
7	Data types in SQL	The exists function, nulls explicit sets aggregate functions and grouping Sub-string comparisons, arithmetic, order by, SQL queries Relational views in SQL Creating indexes in SQL	-Class discussions	- Problem solving skills -Creative thinking skills
8	Transactions Management <b>ASSIGNMENT II</b>	Properties of transactions Interference Transactions states Schedules, serialization and recoverability	-Lectures -Class discussions	-Analytical skills
9	Concurrency control techniques	Locking protocol and techniques Deadlock and starvation	-Lectures -Class discussions	-Analytical skills -Problem solving skills
10	Database recovery techniques <b>CAT II</b>	Causes of database failure Transaction and recovery	-CAT TWO -Lectures Class discussions	-Analytical skills -Problem solving skills
11	Distributed database and Client Server Architecture	Client Server Architecture Distributed systems advantages and disadvantages Data fragmentation and rules of distribution	-Lectures -Class discussions Demonstration	-Creative thinking skills -Innovativeness
12	Security, integrity and control	Security measures and control	-Lectures -Class discussions -Demonstration	-Creative thinking skills -Innovativeness
13	Query optimization	Query processing and Optimization	-Lectures -Class discussions -Demonstrations	-Creative thinking skills -Innovativeness
14	EXAM			
15	EXAM			

#### **4.0 COURSE ASSESSMENT**

The course will be assessed as follows:

Continuous Assessment Tests	20%
Practical Based Assessment	10%
Final Examination	70%
TOTAL	100%

#### **5.0 COURSE TEXTBOOK AND JOURNAL**

- i. C.J Date (2004): An introduction to database system (8<sup>th</sup> ed), Pearson education inc

#### **6.0 RECOMMENDED TEXTBOOKS AND JOURNAL FOR FURTHER READING**

- i. P. Beynon Davies database systems (3<sup>rd</sup> ed)
- ii. Interactive Training Division IDM Computer Studies Ltd (2009): Database Management System Notes
- iii. Ramakrishnan and Johannes, (2003) Database management systems (3<sup>rd</sup> ed)
- iv. Ramez Elmasri, Shamkant B. Navathe (2004): Fundamentals of database systems (4<sup>th</sup> ed)