

**UNIVERSITY OF GHANA**

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**DEPARTMENT OF COMPUTER SCIENCE**

**SCHOOL OF PHYSICAL AND MATHEMATICAL SCIENCES**

**SEMESTER 1, 2024/2025**

**COURSE SYLABUS**

**Course Code and Title: DCIT 305 – DATABASE FUNDAMENTALS**

**Credits: 3**

**Lecture Period(s): Thursdays 5.30pm – 7.20 pm**

**Tutorials Fridays 1.30pm – 2.30 pm & Tuesdays : 2.30pm – 3.30pm**

**Prerequisites**: None

**Course Instructor**

* Name: Dr Matilda A. S. A. Wilson
* Office Location: Comp Sci: Wing, 1st Floor, Room 2

Office Hours: Thursday: 3.30pm – 5.20pm

* Email: matildawilson@yahoo.com

**Teaching Assistant: Ebenezer Acquah (0207087333)**

**Course Description**

Topics covered in this course will include: Database Concepts and Architecture, Database Modelling and Design, Entity-Relationship Model, Normalization, Data Manipulation Language (DML), Data Definition Language (DDL), Data Control Language (DCL), Sub-queries, Multiple Tables, Database Views, Database Triggers, Stored Procedures, Decision and Control Structures, PL/SQL, and Transaction Processing.

A database models and real-world enterprise. For example, a university database might contain information about entities including students, courses, lecturers and relationships between these entities (e.g., student Elsie takes course CSCD313). A Database Management System (DBMS) is a software system designed to store and manage databases. Students will acquire an understanding of these concepts and apply them to model any organization in its database and be able to query database using a relational query language.

**Course Objectives:**

Databases are increasingly being used in almost all organizations for information management. This course provides students with the knowledge and experience of a relational database system.

**Learning Outcomes**

At the end of this **Course**, students will be able to:

1. Discuss the characteristics of databases and database management systems
2. Compare and contrast a variety of data models
3. Examine and design a relational data model for an organization
4. Use relational algebra to explain the basic operations in a database
5. Develop database solutions using Structured Query Language (SQL)
6. Explain current trends in database technology
7. Understand issues relating to database security and authorization

**Course Delivery:**

Online , face-to-face & Laboratory/Tutorial sessions per week.

**Assessment and Grading:**

Continuous Assessment 40%

Final Exam 60%

**Grading Scale:**

Refer to Undergraduate Handbook*.*

**Reading List /Required Text**

# Coronel, C., Morris, S., & Rob, P. (2009).*Database Systems: Design, Implementation and Management*. Australia: Course Technology. ISBN-10: 0538748842, ISBN-13: 978-0538748841

* Gillenson, M. L. (2011). *Fundamentals of Database Management Systems*. New York: Wiley. ISBN-10: 0470624701, ISBN-13: 978-0470624708
* Teorey, T. J., Lightstone, S. S., Nadeau, T., & Jagadish, H. V. (2011).*Database Modeling and Design* (5th ed.). San Diego: Morgan Kaufmann. ISBN-10: 0123820200, ISBN-13: 978-0123820204
* Pratt, P. J., & Adamski, J. J. (2011).*Concepts of Database Management.* Cambridge, Mass: Course Technology. ISBN-10: 1111825912, ISBN-13: 978-1111825911

# Ramakrishnan R. & Gehrke J. (2003). *Database Management Systems*. McGraw-Hill. ISBN 0-07-246563-8, ISBN 0-07-115110-9 (ISE)

**Other Information**

##### Laboratory time schedule would be worked out and announced.

Each student is required to own a laptop and to bring it for the Lab./Tutorial sessions.

**Course Delivery Plan/Schedule**

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| --- | --- | --- | --- |
| **Week** | **Date** | **Lecture Topics / Assessment** | **LAB./Tutorial Activities** |
| **1** |  | Database Concept, Principles  Fundamentals of Design |  |
| **2** |  | Data Models & Database Architecture | Introduction to Oracle server  Create databases and database tables |
| **3** |  | The Relational Model & Relational Algebra | Write simple DDL statements including CONSTRAINTS. |
| **4** |  | Introduction to SQL **Assignment 1** | Write simple DML statement |
| **5** |  | Intermediate SQL | Reporting with SQL |
| **6** |  | Advance SQL |  |
| **7** |  | Database Design Using E-R Model ( IA 1**)** | Write SQL using different operators and aggregate functions. |
| **8** |  | Entity Relationship Model  **Assignment 2** | Write SQL queries.  Using Group By, HAVING |
| **9** |  | NORMALISATION / PL/SQL | Write SQL Subqueries |
| **10** |  | Entity Relationship Model **IA 2** | Write nested SQL queries |
| **11** |  | Other Database Objects  (views, indexes, sequences, functions, triggers, stored procedures), and manipulate data in tables. | Create Other Database objects |
| **12** |  | Stored Procedure Language SQL (PL/SQL) |  |