**CS 432 – Database Systems Syllabus**

**Course Number and Name:** CS432 Database Systems

**Credits:** 3

**Contact Hours:** 3

**Instructor:** Dr. Ling Zheng

**Textbooks:**

Database Systems: The Complete Book, 2nd Edition, by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom; Prentice Hall, 2009 (ISBN: 9780131873254)

Fundamentals of Database Systems, 7th Edition, by Ramez Elmasri and Shamkant B. Navathe; Pearson, 2015 (ISBN: 9780133970777)

**Catalog Description:**

Overview of database system concepts; data modeling; ER and UML diagrams; relational database schema definition; database design; query languages; introduction to NoSQL and comparison between relational and non-relational databases; hand-on experience of SQL, Oracle, and NoSQL.

**Prerequisite:**

CS-205, passed with a grade of C or higher.

**Course Type:** Required course.

**Course Goals:**

After completing this course, students will be able to:

* Comprehend the concepts of relational and non-relational database systems
* Use SQL and NoSQL to manipulate a database
* Design databases using various models and write database applications
* Work in a team, learn cooperation, and practice the skill of presentations and writing

**Outcomes:**

* Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions
* Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.

**Brief List of Topics:**

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| Database Concepts |
| Data Models |
| The Entity-Relationship Model (ER) |
| The Relational Model - Basic Definitions, Integrity Constraints, Update Operations |
| Formal Query Languages - Relational Algebra |
| Mapping ER Model to Relational Model |
| Structured Query Language (SQL) - Data Definition and Simple Queries |
| SQL - More Complex Queries, Updates, Views, Constraints |
| Triggers |
| Introduction to Non-relational Databases |
| Non-relational Database Query |