CS 63005/73005  ADVANCED DATABASE SYSTEMS DESIGN    3 Credit Hours

Instructor’s Name: Dr. Ruoming Jin

Course Materials:


Course Content:
(Cross-listed with CS 73005) Introduction to a variety of advanced database topics and on-going trends in modern database systems. The course includes advanced issues of object-oriented database, XML, advanced client server architecture and distributed database techniques.

Prerequisites or co-requisites: Graduate standing
Required, elective, or selected elective

Goals:
1. Become familiar with the database technology.
2. Understand the relational data model.
3. Learn & apply conceptual data modeling techniques.
4. Become familiar with the database design and normalization theory.
5. Master relational algebra and Structured Query Language.
7. Understand database storage organization and query processing algorithms.
8. Learn database indexing and tuning techniques.
9. Learn administration and development in Oracle and MySQL.
10. Gain practical experience in database and database application development.
11. Learn and obtain skills on empirical evaluation of database systems; efficiency and scalability.
12. Improve technical writing and oral presentation skills.

Outcomes:
1. Understanding of the database technology.
2. Understanding of the relational data model.
4. Familiarity with the database design and normalization theory.
5. Proficiency with relational algebra and Structured Query Language (SQL).
6. Familiarity with database implementation issues.
7. Understanding of the basics of query processing and query optimization.
8. Familiarity with database tuning techniques.
9. Proficiency with the administration and development in Oracle and MySQL.
10. Proficiency with database application development.
12. Further improvement of technical writing and oral presentation skills.

**Topics to be Covered:**
1. Introduction to Database
2. Relational Algebra
3. Basic SQL
4. Advanced SQL
5. ER Diagram
6. Database Design Theory
7. Storage
8. Index
9. Query Optimization
10. Transaction

**Abet Learning 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.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.
- Communicate effectively in a variety of professional contexts.