

CSI 3450: Database Design and Implementation

**Credits Hours:** 4 credits, 3.57 contact hours/week.

**Instructor:** Xiaotong Lin, Ph.D.

**Text book:** Database Systems: Design, Implementation, and Management, 11<sup>th</sup> Ed by Coronel and Morris, ISBN-13: 978-1-285-19614-5,

### **Specific course information**

Introduction to the design and implementation of database systems. Topics include designing a practical database for an application using normal forms, understanding relational database schemas, planning and implementing a database using software such as Oracle and Microsoft SQL Server, advanced database topics in redundancy, replication, loading balancing, compatibility, ODBC and JDBC, and database systems administration.

**Prerequisites:** major standing

**Required course** for CS and IT major

**Course Objectives:** Upon successful completion of this course, students should be able to

- Apply theoretical knowledge to develop database applications using DBMS and SQL language [ABET CS: (a, c, i, k), IT: (a, c, i, j)]
- Effectively use the Entity Relationship diagram for the representation of conceptual schemas [ABET CS: (c, i, k), IT: (c, i, j)]
- Identify functional dependencies and apply normalization algorithms [ABET CS: (b, i, j, k), IT: (b, i, j)]
- Use Data Definition Language to define database schemas [ABET CS: (c, i, k), IT: (c, i, j, k)]
- Construct data retrieval procedures using the Data Manipulation Language [ABET CS: (a, e, g, i, k), IT: (a, e, g, i, j, l)]
- Develop data retrieval procedures using Relational Algebra [ABET CS: (a, e, g, i, j, k), IT: (a, e, g, i, j)]

### **List of Topics:**

- Designing a practical database for an application
- Normal forms
- Relational database schemas
- Planning and implementing a database using software
- Oracle and Microsoft SQL Server,
- Advanced database topics