

# Advanced Database Concepts

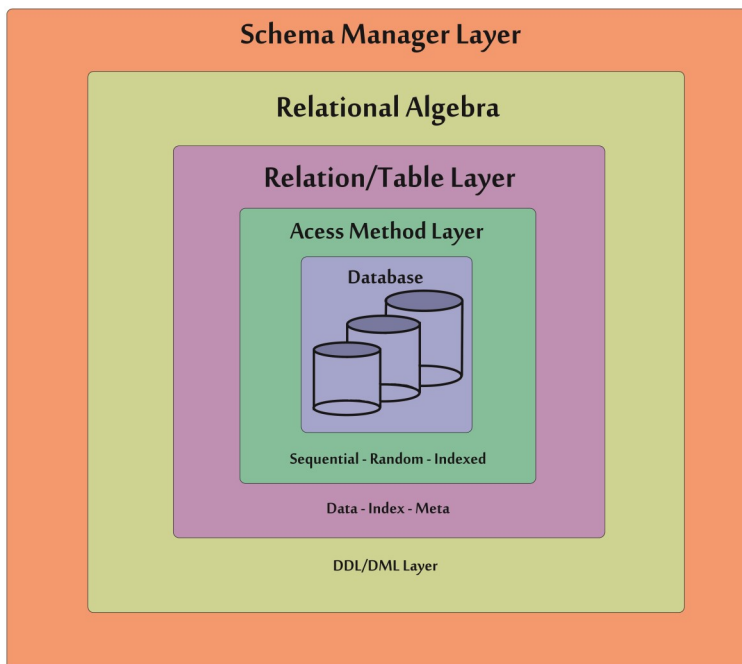
Fall 2017

CSCI-B 561 CSCI-C 490 INFO-I 400 **Instructor:** Dr. Hossein Hakimzadeh ([hhakimza@iusb.edu](mailto:hhakimza@iusb.edu))

**Prerequisites:** CSCI-C 442 or INFO-I 451

**When:** Tuesday & Thursday 5:30-6:45pm

**Course Objective:** This course is intended for advanced undergraduate and graduate students who have already acquired the basic background in data modeling, relational database concepts, relational algebra and SQL. The objective of this course is to introduce students to more advanced concepts and current database topics including the following: database internals and implementation, transaction management and concurrency control, crash recovery, distributed database management systems, security, and object-oriented databases. The course includes a research paper and presentation. In addition, the course includes a substantial programming project.



**Selected topics:** File Organization, Database internals, Transaction Management, Concurrency Control, Query Processing and Query Optimization, Distributed Databases and Client/Server Architecture, Object-Oriented Databases, Database Recovery Techniques, Data Warehousing and Data Mining, Deductive Databases, Database security and Emerging Database Technologies.

**Learning Methods:** Students will examine the above concepts and theories, using a **project-based approach**. During the first phase of the course, each student will implement a simple database engine (Mini-DB). During the second phase of the course, students will identify a topic of interest, conduct research, and propose an implementation plan to extend the Mini-DB. During the third and final phase of the course, student will use their research results and their proposed implementation plan to extend the Mini-DB engine.

If you are self-motivated, hard-working, and want to learn more about how database systems work internally, this is the right course for you!