

Topics in Advanced Database Systems CS 4390/5322

Fall 2015- Syllabus

Instructors:

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Class time: Tuesdays and Thursdays, 1:30- 14:50pm.

Location: CCSB 1.0510

Office hours: Tuesdays and Thursdays, 9:00-10:30pm, 12:00-1:30pm and 3:00-4:00pm and by appointment outside this time.

Please use email to contact instructor.

No teaching Assistant assigned.

Course Catalog Description

Topics in Advanced Database Systems (3-0) A review of relational algebra followed by study of DATALOG and its extensions (negation as failure, aggregates), query optimization, dependencies, and object-oriented databases. Major Restrictions: CS, EE. Prerequisite: CS 5303 with a grade of "B" or better.

Course Outcomes

Divided into the following three broad levels of Bloom's taxonomy:

Level 1: Knowledge and Comprehension.

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level.

Upon successful completion of the course, students will be able to:

- 1a. Describe how relational algebra can be used for the retrieval and manipulation of data represented as relations and its application in relational database management systems.
- 1b. Describe data management paradigms beyond the relational model, including NoSQL and Document Databases.
- 1c. Describe query optimization and distributed databases challenges and approaches to solve these challenges.

Level 2: Application and Analysis.

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details.

Upon successful completion of the course, students will be able to:

- 2a. Apply advanced relational algebra and optimization techniques supported in the relational model.
- 2b. Use non-relational query languages and non-RDBMS.

2g. Apply data management paradigms beyond the relational model and justify which paradigm is more useful than another, or be able to choose a paradigm based on specified characteristics.

Level 3: Synthesis and Evaluation.

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery.

Upon successful completion of the course, students will be able to:

3a. Design a database system from a problem statement.

3b. Select the most adequate data management paradigm and implement it for a specific problem.

Topics

The topics covered in this course include:

1. Relational model and advanced relational algebra.
2. Distributed databases.
3. New Data Management Paradigms including NoSQL and Document Databases.
4. Database Security.
5. Optimization Techniques.
6. Ethics in Database Management.

Grading

1. Exams 40%.
2. Project and Assignments including presentations 40%.
3. Class participation and class activities 20%.

Textbook

Fundamentals of Database Systems (Seventh Edition preferred but also Sixth Edition). Ramez Elmasri and Shamkant Navathe. Ed. Addison-Wesley. ISBN10: 0136086209.

Standards of conduct

Students are expected to conduct themselves in a professional and courteous manner, as prescribed in the Student Conduct and Discipline section of UTEP's Standards of Conduct available [here](#). Graded work should be of your own, plagiarism will not be tolerated. Professors are required to report academic dishonesty and any other violation of the Standards of Conduct to the Dean of Students.

Students may discuss requirements and background information. However, designs, implementations and documentation must be prepared individually or by the members of the group assigned. The Dean of Students has published a website with complete details concerning the UTEP Academic Honesty policy available [here](#).

Academic accommodations

If you have a disability and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.