

CST 333/433 Database Systems (Spring 2009)

Time and location

- Online course: roosevelt.blackboard.com
- Content time: Monday, 8:00 am

Instructor

Dr. Evgeny Dantsin

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- Office hours: Monday 4:00 pm - 6:00 pm, GB 506B

Teaching assistant

Remi Arntzen

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- Lab hours: [Graduate assistant schedule](#)

Course description

Theory and practice of databases with emphasis on how to create, maintain, and query a database with SQL. Relational databases and relational algebra, queries and data manipulation in SQL, constraints, triggers, views, controlling security, data modeling and normalization, recursive queries, indexing, XML, and other topics.

Software

Access 2007 (Microsoft Office 2007)

Textbooks

- **Primary book:** Jeffrey D. Ullman and Jennifer Widom. *A First Course in Database Systems*. 3rd Edition. Prentice Hall, 2007. ISBN-10: 013600637X.
- **Recommended book:** Abraham Silberschatz, Henry F. Korth, and S. Sudarshan. *Database System Concepts*. 5th Edition. McGraw-Hill, 2006.
- **Recommended book:** Gary Randolph and Jeffrey Griffin. *SQL Essentials*. Franklin, Beedle & Associates, 2005.

Prerequisites

MATH 245 - Discrete Structures (recommended)

Tentative schedule

Week	Topics	Assignments	Textbook
1	Course introduction: Database systems. Data models and the relational data model. Relational algebra operations.		1.1, 2.1-2.2, 2.4.1-2.4.6
2	Relational algebra operations (contd.). Introduction to SQL. Basic SQL queries.	HW-1	2.4 (except 2.4.9 and 2.4.11), 6.1

3	SQL queries involving more than one table.		6.2
4	Subqueries in SQL.	HW-2	6.3
5	Aggregation and grouping. Query evaluation in SQL.	HW-3	6.4
Spring Break			
6	Data definition and data manipulation in SQL. Constraints. Keys.		2.3, 6.5
7	Foreign keys. CHECK constraints and assertions.	Midterm	7.1-7.4
8	Triggers. Use of triggers in database programming.		7.5
9	Views. Schema design and functional dependencies.	HW-4	8.1-8.2, 8.5, 3.1, 3.2.4, 3.3.1-3.3.3
10	Recursive queries and Datalog. Recursion in SQL.		5.3, 10.2.1
11	Indexing in databases. Selection of indexes.	HW-5	8.3-8.4
12	Semistructured data and XML. Querying XML data.		11.1-11.3, 12.1-12.2
Exam Week	Final exam		

Assignments and grading

Grades will be determined by the total number of points earned on the following assignments:

- homework assignments (total maximum: 60 points);
- midterm exam (maximum: 20 points);
- final exam (maximum: 20 points).

In addition to the above assignments, graduate students must select an additional topic in databases (in conjunction with the instructor), research this topic, and write an 8-10 page report (20 points). No late homework will be accepted; no make-ups will be given. Instances of academic dishonesty will be handled as described in University policies. Grades will be assigned according to the following scale (the plus/minus grading system is not used in this course):

A	B	C	D	F
≥ 90%	≥ 75%	≥ 60%	≥ 45%	< 45%

The last day to withdraw with a “W” grade is 04/13/09.