

CIS 560: Database Management Systems

Fall 2008

Hours: 3 hours; 3 hour extended course project option (CIS 499, 598, 690) available

Prerequisite: CIS 301, Logic for Computer Science.

Textbook: Silberschatz, A., Korth, H. F., & Sudarshan, S. (2006). *Database System Concepts*, 5th edition. New York, NY: McGraw-Hill. ISBN: 0072958863.

Venue: MWF 11:30 – 12:20 (lecture MW, lecture/labs alternate F), Rooms 127 & 128 Nichols Hall

Instructor: William H. Hsu, Department of Computing and Information Sciences

Office: 213 Nichols Hall URL: <http://www.cis.ksu.edu/~bhsu> (calendar posted here)

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Office hours: MWF 12:20 – 13:20, 14:20 – 15:20, T 08:30 – 10:30, appointment (see calendar)

Course web group: K-State Online (KSOL) <http://snurl.com/1pg4c>

Course web page: <http://www.kddresearch.org/Courses/Fall-2008/CIS560/>

Tegrity lectures: Linked from course web page and KSOL

Course Description

This course provides an introduction to database management systems, including discrete mathematical structures and set theory foundations of databases, theory and practice of database systems, modern database design techniques, and some applications. The first half of the course will emphasize taxonomies of databases (flat, object-oriented, hierarchical, and relational), database theory (normal forms, structured queries), fundamental theory, and query design. The second half will delve deeper into database theory and examine topics in theoretical and applied databases: modern DBMS; data warehousing, modeling, and mining; online analytical processing (OLAP); semistructured data (XML) and the web; database research; online databases and DB security.

Course Requirements

Component	Components	Grade Value	Total Value
Exams and quizzes	2 hour exams	30% (15% each)	60%
	1 final exam	30%	
	Quizzes	0%	
Homework and class participation	4 of 5 written problem sets	8% (2% each)	16%
	4 of 5 machine problems	8% (2% each)	
Term project (DB implementation)	Planning/design, interview	5%	17%
	Intermediate milestone	6%	
	Implementation, report	6%	
	Peer review	1%	
Class participation	Attendance	3%	7%
	Answering questions	2%	
	Discussion	2%	

Selected reading (on reserve in K-State CIS Library):

- **Recommended text:** Sunderraman, R. (2004). *Oracle 9i Programming: A Primer*. Reading, MA: Addison-Wesley. ISBN: 0321194985

Additional bibliography (excerpted in course notes and handouts):

- Ramakrishnan, R. & Gehrke, J. (2003). *Database Management Systems*, 3rd edition. New York, NY: McGraw Hill. ISBN: 0072465638
- Elmasri, R. & Navathe, S. B. (2003). *Fundamentals of Database Systems*, 4th edition. Reading, MA: Addison-Wesley. ISBN: 0321206746

Course Calendar

Lecture	Date	Topic	(Primary) Source
0	Mon 25 Aug 2008	Overview, database system concepts	Chapter 1
1	Wed 27 Aug 2008	Set theory review	Chapter 1
2	Fri 29 Aug 2008	Intro to RDBs, relational algebra	Chapter 1, 2
3	Wed 03 Sep 2008	Relational joins	Chapter 2
4	Fri 05 Sep 2008	Implementing joins	Chapter 2, Chapter 3
5	Mon 08 Sep 2008	PHP and MySQL basics	Chapter 3, Handout
6	Wed 10 Sep 2008	MySQL: cursors and views	Chapter 3, 4
7	Fri 12 Sep 2008	SQL: embedded, ODBC/JDBC	Chapter 4
8	Mon 15 Sep 2008	Relational division	Chapter 4
9	Wed 17 Sep 2008	Relational calculus and datalog	Chapter 5
10	Fri 19 Sep 2008	JSP setup and intro	Handout
11	Mon 22 Sep 2008	GQBE in Microsoft Access	Chapter 5
12	Wed 24 Sep 2008	Database design overview	Chapter 6
13	Fri 26 Sep 2008	Entity-relational (E-R) data modeling	Chapter 6
14	Mon 29 Sep 2008	E-R diagrams and UML	Chapter 6
15	Wed 01 Oct 2008	Normal forms (1NF); exam 1 review	Chapter 7
16	Fri 03 Oct 2008	2NF-3NF, BCNF, 4NF	Chapter 7
	Wed 08 Oct 2008	PHP Intro // Hour Exam 1	Chapters 1-7 (focus: 1-6)
17	Fri 10 Oct 2008	Web DBs, server-side programming	Chapter 8, Handout
18	Mon 13 Oct 2008	Exam 1, database design review	Chapter 7
19	Wed 15 Oct 2008	Web databases: forms and GUIs	Chapter 8
20	Fri 17 Oct 2008	OR data models and OODB	Chapter 9
21	Mon 20 Oct 2008	More servlets and JSP	Chapter 8
22	Wed 22 Oct 2008	Triggers, XML intro	Chapter 8, 10
23	Fri 24 Oct 2008	Importing, exporting, migrating DBs	Chapter 10, Handout
24	Mon 27 Oct 2008	XML structure, applications	Chapter 10
25	Wed 19 Oct 2008	Index files	Chapter 12
26	Fri 31 Oct 2008	Indexing/ hashing, Exam 2 review	Chapter 12
27	Mon 03 Nov 2008	Indexing, query processing (select)	Chapter 13
28	Wed 05 Nov 2008	Query processing: sorting, joins	Chapter 13
	Fri 07 Nov 2008	Hour Exam 2 // DB query costs	Chapters 7-8, 10, 12-13
29	Mon 10 Nov 2008	Exam 2, DB implementation review	Chapters 7, 8, 10, 12-13
30	Wed 12 Nov 2008	Course project review	-
31	Fri 14 Nov 2008	ORACLE primer	Handout
32	Mon 17 Nov 2008	ORACLE primer	Handout
33	Wed 19 Nov 2008	Transactions: ACID property def'ns	Chapter 15
34	Fri 21 Nov 2008	Transactions: ACID implementation	Chapter 15
35	Mon 24 Nov 2008	Concurrency: basic concepts	Chapter 16 (survey)
36	Mon 01 Dec 2008	Data mining	Chapter 18
37	Wed 03 Dec 2008	Data warehousing and OLAP	Chapter 18, Han excerpt
38	Fri 05 Dec 2008	Databases and Web Search	Chapter 19
39	Mon 08 Dec 2008	Info retrieval	Chapter 19 – 20
40	Wed 10 Dec 2008	Final exam review	Ch. 1-9, 10, 12 -13, 15, 18-20
41	Fri 12 Dec 2008	Term project discussions	N/A
		FINAL EXAM	Ch. 1-9, 10, 12-13, 15, 18-20

Lightly-shaded entries denote the due date of a written problem set.

Heavily-shaded entries denote the due date of a machine problem (programming assignment)

Interim project interviews will be held between the first and second hour exams (before spring break).

The **green-shaded date** is the due date of the draft project report and demo, with interviews and presentations to be held the last week of class.