

COMP 7116 Advanced Database Systems – Spring 2010
Dr. King-Ip Lin

Contact Information:

Office: 355 Dunn Hall	Department Office: 209 Dunn Hall
Phone: 678-3135	Department Phone: 678-5465
E-mail: davidlin@memphis.edu	

Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
5:00 – 6:00pm			2:30 – 3:30pm	
<i>Also by Appointment</i>				

Course Description:

COMP 7116 - Adv Database Systems (3)

Advanced data modeling; object-oriented and object-relational databases; indexing of complex data; advanced transaction processing; on-line analytical processing and data warehousing; distributed database processing. PREREQUISITE: COMP 7115 or permission of instructor.

Why this course?

This course is a continuation of COMP 7115. It will introduce the student to more advanced issues in database systems design and implementation. Students will gain knowledge of the internal working of a database system, which will be helpful in both database maintenance and implementation. Also the class will introduce the students to emerging trends in databases.

Topics to be covered include:

1. Basic requirements for database systems : buffering, operating system support.
2. Concurrency control : Ensuring consistency; transaction; serializability ; locking; timestamp ordering
3. Recovery: Recovering techniques; ARIES.
4. Query optimization: Standard Techniques.
5. Physical database tuning.
6. Advanced indexing and database algorithms

Resources:

Required Text

Silberschatz, Korth & Sudarshan, "Database Management Systems", 5th edition, McGraw-Hill (ISBN: 0-07-295886-3)

Other Resources:

Evaluation:

Evaluation is based on the following 5 components, details to be provided:

	Weight	Date
Mid-term	20%	3/4 (Thu) During class
Final Exam	20%	4/27 (Tue) During class
Database programming project	15%	Due 3/18 (Thu) 12:00 noon
Project	30%	Presentation: 5/6 (Thu) 10:30 – 12:30
Presentation	15%	4/13 – 4/22 During class

+/- grades will be used. If a student failed to obtain 70% of the full mark in at least two of the categories, the best he/she can hope for is an A-. If a student failed to obtain 60% of the full mark in at least three of the categories, the best he/she can hope for is a B-.

Course Policies:

Attendance: Students are expected to attend every class.

Testing Policy: No early or late exams are allowed unless under extreme situations. For students who wish to travel back home during Christmas, do not expect exam to be taken earlier than Dec 12th (Mon).

Plagiarism/Cheating Policy:

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and **will not be tolerated**. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but **appropriate references must be included for the materials consulted**, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to:

<http://www.people.memphis.edu/~jaffairs/>

Course Syllabus

Lecture	Date	Lecture Topics	Textbook
1	1/14	Introduction	
2	1/19	Transaction Processing Concepts	15.1 – 15.4
3	1/21	Serializability	15.5 – 15.8
4	1/26	Lock based protocols (1)	16.1
5	1/28	Lock based protocols (2)	16.6 – 16.7
6	2/2	Lock based protocols (3)	16.4, 16.8
7	2/4	Non-lock based protocols	16.2-16.3, 16.5
8	2/9	Recovery overview	17.1 – 17.5
9	2/11	ARIES	17.8
10	2/16	Indexing: Bitmap index	12.9
11	2/18	Indexing: Spatial index (1)	24.3
12	2/23	Indexing: Spatial index (2)	24.3, notes
13	2/25	Indexing: Spatial index (3)	Notes
14	3/2	Mid-term	
15	3/4	RAID/Buffering	11.3, 11.5
	3/9	<i>Spring Break – no class</i>	
	3/11	<i>Spring Break – no class</i>	
16	3/16	Query optimization (1)	13, 14.1 – 14.3
17	3/18	Query optimization (2)	14.4 – 14.5
18	3/23	Physical database tuning/benchmarks	23.1 – 23.2
19	3/25	Data Engineering Issues	Notes
20	3/30	OLAP/Data Warehousing (1)	18.1 – 18.2
21	4/1	OLAP/Data Warehousing (2)	18.3, Notes
22	4/6	Distributed Databases (1)	22.1 – 22.4
23	4/8	Distributed Databases (2)	22.5 – 22.8
24	4/13	Presentation (1)	13.6
25	4/15	Presentation (2)	
26	4/20	Presentation (3)	
27	4/22	Presentation (4)	
28	4/27	Final exam	