INLS 690 Advanced Databases
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Course Description: This class is the capstone to a three-semester sequence in relational databases. The first two classes have concentrated on the basics of database use and the concepts behind data modeling in Entity-Relationship and in Relational contexts. This class will cover advanced topics that Database Administrators (DBAs) need to understand database performance, concurrency control, and disaster recovery.

Class periods will either be lectures or labs. Lectures are intended to illuminate some of the more difficult parts of the readings. We'll work some solutions to examples presented in the readings during the lectures, for instance. The labs, by contrast, are very hands-on activities so you can begin to manage databases and troubleshoot problems on your own.

Prerequisite: INLS 523, the introductory database class, is the only formal prerequisite. It's possible to take this class concurrently with INLS 623, the second semester database class. By the time we get to Query Optimization (nominally, week 5) you should be quite familiar with SQL and writing very complicated SELECT statements.

Office Hours: I work full time for UNC, but my office is off campus at 100 Europa Drive, Suite 540. You are welcome to meet with me there any time you want to, but I strongly suggest you email and find a time when you know I'll be there I also spend a lot of time at NCSU. I have use of a shared office in Manning (room 20, on the Garden Level) and will hold regular office hours there from 4:30 until 6:00pm on Wednesdays.

Grading Schema:
5 In-Class labs: 30% (6% each)
4 Homework Assignments 30% (7.5% each)
1 Take-Home Final 40%

Grade Assignment:
Graduate Percentage
H 100 - ¬95%
P 94 - ¬80%
L 79 - ¬70%
F Below 70%

Undergraduate Percentage
A 100 - ¬90%
B 89 - ¬80%
C 79¬ - 70%
D 69¬ - 60%
F Below 60%

Honor Code: The UNC Honor Code applies to all work in this course. When work or ideas are not your own, you must attribute them. Unless otherwise stated, all assignments in this class are individual assignments, meaning that the substance of the work you turn in must be your own. If you have any doubts or questions about a course of action or a specific situation, please ask for clarification. Students should NOT receive (or give) major creative assistance or ongoing minor support on individual assignments, unless permitted explicitly. For more information, see https://studentconduct.unc.edu/ . If you have any questions about this, please ask me.

Special Accommodations: The University of North Carolina Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in difficulties with accessing learning opportunities.
All accommodations are coordinated through the Accessibility Resources and Service (ARS) Office. In the first instance please visit their website http://accessibility.unc.edu , Tel:¬ 919 ¬962¬ 8300 or Email accessibility@unc.edu . A student is welcome to initiate the registration process at any time, however, the process can take time. ARS is particularly busy in the run¬up to Finals and during Finals. Students submitting Self¬ID forms at that time are unlikely to have accommodations set until the following semester. Please contact ARS as early in the semester as possible.

Mutability: This syllabus may be updated at any time, particularly as course reserves and other readings are established, or if adverse weather forces a change in class schedule. I will (of course) follow the schedule of the university, and the university will announce any closings via AlertCarolina. Make sure you can receive these messages.

Schedule:

Wk 1
Wed Jan 10th Intro, Logistics, Tour of the Semester, and Hitting the High Points of CH 17 and 18 file organization and indexing.

Wk 2:
Mon Jan 15th Dr. Martin Luther King holiday University is Closed
Wed Jan 17th Lab 1 Postgres Installation and Tablespace manipulation

Wk 3:
Mon Jan 22nd Will discuss Elmasri and Navathe (E&N) CH 17 - “Disk Storage, Basic File Structures, and Hashing” and CH 18 - “Indexing Structure for Files”.
Wed Jan 24th Lab 2 GUI Tools Lab

Wk 4:
Mon Jan 29th Will Discuss E&N CH 21 and 22 Intro to Transaction Processing Concepts and Theory, and Concurrency Control Techniques
Wed Jan 31st Lab 3 Transactions Lab

Wk 5:
Mon Feb 5th Conclusion of Concurrency Control Techniques
Wed Feb 7th Will Discuss E&N CH 19 Algorithms for Query Processing and Optimization

Wk 6:
Mon Feb 12th Lab 4 Query Plans, Optimization, Explain, and Database Statistics (Caution: Basketball Traffic)
Wed Feb 14th OLTP, OLAP, and Specialized Schemas

Wk 7:
Mon Feb 19th - Database Recovery Techniques
Wed Feb 21st Lab 5 Recovery and Replication

Wk 8:
Mon Feb 26th Geospatial databases
Wed Feb 28th Capacity Planning and Performance Tuning

Wk 9:
Mon Mar 5th Review of Topics
Wed Mar 7th Final Exam Due By 11:59pm