INLS 690-163
Database System III
Spring 2016

Tuesday-Thursday, 9:30 – 10:45am, Manning 303
(January 12 - February 25)

Instructor:
Arcot Rajasekar
Office: Manning 021
Office Hours: 11:00 – 12:15 pm Tue/Thu, and by appointment
Email: rajasekar at unc dot edu

Course Description: In this course we study concepts in database planning and administration. Topics include relational database configuration, administration and monitoring, security, performance tuning and disaster recovery. We will also touch upon emerging concepts in NoSQL database and Hadoop administration.

Prerequisite(s): INLS 623 – Database Systems II or equivalent

Textbook (required):
Fundamentals of Database Systems, Sixth Edition
Elmasri, R. and Navathe, S.B., Pearson Addison Wesley.
(5^{th} edition is also okay – but chapters are moved around)

Grading Scheme:

1.	Class participation	10%
2.	Forum participation	5% (using sakai)
3.	Journal	10% (using SILS Lifetime Library)
4.	Homeworks	15% (3 homeworks)
5.	Lab and Projects	30% (6 labs with project)
6.	Final exam	30% (using sakai)

1. Course Objectives

- Advanced concepts and issues in database design and administration
- Hands on Relational Database administration and monitoring (PostgreSQL and Oracle)
- Hands on NoSQL Database Administration (MongoDB)

2. Hardware and Software Requirements

You will be installing and administering relational databases and a NoSQL database on your own laptop.

3. Graded Work

Your grade will be based on class and forum participation, keeping a journal, and through lab work and projects, homeworks and a final exam, weighted as shown under "Grade Weighting" on the first page.

Class Participation

I require all students to participate actively in class discussions throughout the class. At the beginning of each class, we will have a common discussion period, where we will discuss current events related to topics in the course. I expect that every student reads the 'required reading' list before the class. As the

class proceeds, I will be looking for questions, comments and a lively dialogue on the presented material as well as on the required reading materials.

Forum Participation

Apart from class participation, I also expect students to actively participate in forum posts on topics related to the course. Sometimes I will start a thread of conversation, but I also expect everyone to start and take part in multiple threads of conversations. sakai forums will be used for this purpose. .

Journal

Each student is expected to maintain a journal. This is something of a personal digital library where one will keep all materials related to this course, gathered in the course or elsewhere. I expect material beyond the reading list to be part of your journal. Current events and class discussion topics can also be part of your journal. I also expect tags, metadata and your own commentary added for each material as an outcome of your reading the material. I would require the use of the SILS Lifetime Library (http://lifetime-library.ils.unc.edu/) for maintaining the journal as it allows controlled sharing. Please make the material readable by me so that I can evaluate the progress. This journal will be a persistent digital library that may help you later after the course and which you can grow as you gather more relevant material. There are a set of tutorial videos at the Lifetime Library site which will help you in using the system, if you are not already familiar with it.

Homeworks

I am planning on giving three homeworks based on the theory portion covered in class. The homework will also be helpful for preparing for the final exam. Homeworks will be required to be submitted through the Lifetime Library. Each homework will have one week submission deadline, unless otherwise noted. No copying is allowed for homework. Honor code will be strictly enforced.

Lab and Project work

I am planning on six projects with PostgreSQL. These projects will start in the lab period but will be finished later at home and required to be submitted through the Lifetime Library. All lab work will be on Thursdays and will be due by next Monday evening. You can consult with friends and class members about lab and project work. Helping each other is encouraged. But no copying or mimicking others work. Learning and doing individually is expected.

Exam

There will be one final exam. It will cover the theory part and will be comprehensive, covering the whole course. It will be closed book, closed notes, closed electronics. No consultation, whatsoever. Duration of the exam will be one hour. But the exam will be open for more than three days. You can take in any one hour window in the open time frame. It will be proctored through sakai, and timed for one hour duration. Honor code will be strictly enforced.

4. Grading Policies

The following grade scale will be used AS A GUIDELINE (subject to any curve):

Graduate Percentage	Undergraduate Percentage
H 100-95%	A 100-90%
P+ 94-90%	B 89-80%
P 85-89%	C 79-70%
P- 80-84%	D 69-60%
L 70-79%	F Below 60%
F Below 70%	

This scale will be used as a GUIDELINE ONLY. The final grade scale may differ.

Due Dates and Late Work
Each assignment will have a due date and time and will include instructions for submission. Late submissions will not be given any credit if submitted after graded assignments or solutions have been released. Typically, a late penalty of 10% per day will be applied unless prior arrangements have been made with the instructor.

Requests for Extensions and Absences
Any request for an extension must be made, preferably by email, at least 24 hours prior to the due date. Written documentation is required for illness. If a serious illness prevents you from taking any of the tests, send your instructor an e-mail message, or a friend with a note, describing your condition before the scheduled test. Also, to establish a valid excuse for an illness you must get a note from a physician or the University infirmary. Before missing a test for any reason, you must make every effort to discuss the problem with your instructor before the day of the test.

Statute of Limitations
Any questions or complaints regarding the grading of an assignment or test must be raised within one week after the score or graded assignment is made available (not when you pick it up).

5. Course Communication (Sakai)

Sakai-based course website has been set up and it is the responsibility of every student to **check the Sakai website regularly** for announcements and materials. The Announcements section and sakai email will be used for all **official announcements** related to the class. Your instructor may announce tests, assignments, or changes to assignments in class, but there is no guarantee or promise that such announcements will be made in class. The Announcements section of the website and sakai email will be the **only** official, reliable source for announcements, changes, etc. from the instructor. If something the instructor says in class conflicts with information posted by the instructor through the website, then the information posted on by the instructor **through the Sakai website takes precedence**. Verbal instructions are easily misinterpreted, and they do not leave a documentation trail. All students should be able to access the system.

6. Honor Code

The UNC Honor Code is in effect for 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. If you have any questions about this, please ask me.

7. Special Accommodations

If any student needs special accommodations, please contact the instructor during the first week of classes.

8. Tentative Timeline

No.	Date	Type	Topic
1	01/12	Theory	Intro to Advanced Database Systems
2	01/14	Lab	Installation and Administration of RDB
3	01/19	Theory	Transactions
4	01/21	Lab	Administration, Monitoring & Performance Tuning of RDB
5	01/26	Theory	Serializability
6	01/28	Lab	Administration, Monitoring & Performance Tuning of RDB
7	02/02	Theory	Schedules, Locks & Deadlocks
8	02/04	Lab	Extensions, Locking and Lock Recovery in RDB
9	02/09	Theory	Statistics, Query Optimization
10	02/11	Lab	Query Planning
11	02/16	Theory	Security, Failure & Disaster Recovery of RDB
12	02/18	Lab	Disaster Recovery Administration
13	02/23	Theory	NoSQL databases
14	02/25	Lab	NoSQL Administration & Wrap up
Exam	02/26-29	Exam	Final Exam (closed book, using sakai, 1hr, open 3+ days)

9. Reading List

Week of	Readings
01/12	Chapter 21 & refresh chapters covered in DBI and DBII
01/19	Chapter 20 and 22
01/26	Chapter 23
02/02	Chapter 19
02/09	Chapter 24
02/16	Papers on NoSQL
02/23	Review all chapters, presentations and papers for final exam