INLS 523: Database Systems I (3 credits)

SYLLABUS, FALL 2016

School of Information and Library Science, UNC-Chapel Hill

Instructor: Shenmeng Xu [shenmeng at email doc unc dot edu]
Class hours: Thursdays, 2:00-4:45 p.m., in 208 Manning Hall
Office hours: Tuesdays & Wednesdays, 1:00-2:00 p.m., or by appointment, in 008 Manning Hall

Course Description

This course will introduce the basic concepts and applications of relational database management systems, including semantic modeling and relational database theory. Topics include:

- User requirements and specifications
- Semantic data modeling
- Relational model
- Structured Query Language (SQL)
- Normalization and data quality
- Relation topics and emerging technologies

From SILS course description:

> Design and implementation of database systems. Semantic modeling, relational database theory, including normalization, query construction, and SQL.

Prerequisite: INLS 161 for undergraduates; Satisfactory completion of the SILS Information Technology Competency Requirement or INLS 161 for graduate students.

Resources:

- Textbook: <u>Fundamentals of Database Systems</u>, Sixth Edition, Elmasri, R. & Navathe, S. (2015), Addison-Wesley. (Or editions 5 or 7.)
- MySQL Community Server Package http://dev.mysql.com/downloads/mysql/
- UNC Sakai site:
  - additional class materials in the Resources folder
  - homework assignments in the Assignments folder
  - class wiki page in the Wiki folder
  - class online discussions in the Forums folder
  - quizzes and exams in the Tests & Quizzes folder

Course Objectives

Through this course, students will:

- Garner a basic understanding of databases, and specifically of the relational database model
- Experiment with both the theoretical and practical aspects of database design and implementation
- Develop proficiency with entity-relationship modeling
- Learn how to use SQL to create, manipulate, and query databases
- Be able to consider, discuss, and justify database design decisions
- Gain an understanding of important ideas for databases in the future

Graded Work

Your grade will be based on homework assignments, quizzes, a class project, a midterm exam, and a final exam, and course participation. These will be weighted as shown below.

Grade Weighting:

Attendance & Participation	10%
Homework Assignments	40%
Quizzes	10%
Class Project	20%
Midterm Exam	10%
Final Exam	10%

Attendance & Participation: Students are expected to regularly attend and participate (to answer questions, and to present work from homework assignments and in-class exercises) in class. Your participation grade will be based on regular class attendance, courteous behavior in class, being prepared for class, being fully engaged during class, and being active on Sakai Forums and Wiki.

Homework Assignments: Developing proficiency in database concepts requires a good deal of practice. As such, this course includes seven homework assignments designed to give you practice applying the concepts that are discussed in class. Detailed Instructions will be given for each assignment. Homework assignments are to be completed individually.

Quizzes: This course includes three quizzes designed to gauge your understanding of course material. There will also be several in-class exercises to give you hands-on experience applying concepts we discuss. The exercises may include a component that will be turned in as a "quiz".

Class Project: Students will work in groups to design and implement a database project. You will create a completed model and design, as well as a final implemented database, loaded with data and demonstrated with representative queries. There will be four deliverables and one final presentation for the Class Project. Members in the same group will receive the same grades.

Exams: There will be a mid-term exam and a final exam. The final exam is given in compliance with UNC final exam regulations and according to the UNC Final Exam Calendar.

Grading Policies

Grade Scale GUIDELINE for Undergraduate Students:

Grade Range	Definition*
A 90-100%	Mastery of course content at the <u>highest level of attainment</u> that can reasonably be expected of students at a given stage of development. The A grade states clearly that the students have shown such <u>outstanding promise</u> in the aspect of the discipline under study that he/she may be strongly encouraged to continue.
B 80-89.9%	<u>Strong performance</u> demonstrating a high level of attainment for a student at a given stage of development. The B grade states that the student has shown solid promise in the aspect of the discipline under study.
C 70-79.9%	<u>A totally acceptable performance</u> demonstrating an adequate level of attainment for a student at a given stage of development. The C grade states that, while not yet showing unusual promise, the student may continue to study in the discipline with reasonable hope of intellectual development.
D 60-69.9%	<u>A marginal performance</u> in the required exercises demonstrating a minimal passing level of attainment. A student has given no evidence of prospective growth in the discipline; an accumulation of D grades should be taken to mean that the student would be well advised not to continue in the academic field.
F 0-59.9%	For whatever reason, <u>an unacceptable performance</u>. The F grade indicates that the student's performance in the required exercises has revealed almost no understanding of the course content. A grade of F should warrant an advisor's questioning whether the student may suitably register for further study in the discipline before remedial work is undertaken.

Grade Scale GUIDELINE for Graduate Students:

Grade Range	Definition*
H 95-99%	High Pass
P 80-94.9%	Pass
L 70-79.9%	Low Pass
F 0-69.9%	Fail

*Definitions are from: http://registrar.unc.edu/academic-services/grades/explanation-of-grading-system/

*These scales will be used as a GUIDELINE ONLY. The final grade scale may be subject to any curve.

Due Dates and Late Work:

The assignments are normally due on <u>Wednesdays before 2:00 p.m</u>. A late penalty of 10% per day will be applied unless prior arrangements have been made with the instructor. Students are highly encouraged to submit the assignments even if it is late.

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.

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.

UNC Honor Code

The principles of academic honesty, integrity, and responsible citizenship govern the performance of all academic work and student conduct at the University as they have during the long life of this institution. Your acceptance of enrollment in the University presupposes a commitment to the principles embodied in the Code of Student Conduct and a respect for this most significant Carolina tradition. Your reward is in the practice of these principles. Your participation in this course comes with the expectation that your work will be completed in full observance of the Honor Code. Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work. (From the 8/1/1992 letter to the faculty, signed by Paul Hardin, Chancellor, and John Moody, Student Body President.)

The UNC Honor Code prohibits giving or receiving unauthorized aid in the completion of assignments. Students are encouraged to cooperate and assist one another and share insights and respective expertise in this course. However, individual homework assignments are to be done individually. All work you submit should be your own. It is crucial that in every case where you use the actual written words of others, that these be properly quoted and cited. When you build arguments upon the ideas of others, the originators of those ideas should also be cited.

More information is available at: http://studentconduct.unc.edu/honor-system.

Section II. B. of the "Instrument of Student Judicial Governance" gives examples of actions that constitute academic dishonesty: https://studentconduct.unc.edu/sites/studentconduct.unc.edu/files/documents/Instrument.pdf

Course Policies

General Policies:

- An <u>open atmosphere,</u> in which members of the class respect each other and comment in helpful ways on each other's work, is strongly encouraged.
- <u>Active learning</u> strategies are incorporated in this course. Students are expected to learn by doing besides passively listening. Read, write, reflect, discuss, ask questions, be engaged in solving problems… These are all ways to contribute to the class and to your own learning.
- <u>Class materials will be available after class</u> (in the Resources folder on Sakai) so that you don't have to write down the basic information presented during class, hopefully allowing you to concentrate on the discussions and additional information.
- At the end of each class, students will submit a brief (ungraded) <u>One-Minute Paper</u> as class reflection. It also serves as a channel to communicate with the instructor weekly.

Laptop and Phone Policy:

- <u>Bring your laptop to every class session</u>. We will use them to research information, access class materials, work on exercises, and present our work.
- <u>The use of cell phones is prohibited</u> during class. Except in emergencies, those using them must leave the classroom for the remainder of the class period.

Course Communication

Communication is extremely important in teaching and learning, so please pay attention to this section carefully. Here is the most effective way to receive announcements, submit assignments, participate in online class discussions, and reach me. Please do not hesitate to get in touch if you have any questions or comments.

Sakai:

- **Course Announcements**: I will often use the Sakai messaging feature to post announcements to the class. Usually these posts will also be sent via email to each student's email address of record. However, it is the responsibility of every student to check the Sakai site regularly for announcements and messages.
- **Assignments**: In order for you to receive credit for an assignment, it must be submitted using the Sakai "Assignments" section. It is the responsibility of each student to make sure they have access to Sakai and can submit assignments when they are due. You should also verify that each assignment you submit has uploaded correctly. If for some reason you are unable to submit an assignment to Sakai, as a last resort you may email it to the instructor along with a note about the problem you encountered. Then, as soon as you are able to, it is your responsibility to submit the exact same assignment to Sakai. The email serves as a record that you tried to submit the assignment on time, but to receive credit, your assignment must be uploaded to Sakai.

- **Wiki and Forums:** Be a good citizen. Students' activities on the Wiki and the Forums are graded as part of the Attendance & Participation grades.
  - o The Wiki is a place students can develop a collection of resources about the topic they are studying, and make them available to the whole class. Everyone has access to editing, and all the edits leave traces, so that you could edit your classmates' work to improve upon them. Now we have two folders: 1) A *Class Members Wiki*; 2) *Interesting Databases*. We also have a *Terms to Master* page, which will be used collectively for review purpose.
  - o The Forums is a place for general discussions. You can for example, start a discussion about current issues or news involving databases, or asking a question of general interest about course content of technology.

Email:

Email is the best way to contact me regarding quick and simple class-related communication. If you have a detailed question about an assignment or class concept, I encourage you to stop by my office during office hours (or schedule a time to meet with me). I usually reply to student emails within 24 hours on weekdays.

Office Hours:

My office hours are on Tuesdays & Wednesdays, 1:00-2:00 p.m., or by appointment. My office, 008 Manning Hall, is by the IISL (Interactive Information Systems) Lab on the Ground Floor.
In addition to my office hours, I am typically available in the 15-min break between the two class sessions, and before 5:00p.m. after class.

Course Schedules

Date	Topic(s)	Reading	Homework and Project
Aug 25	Course Introduction		
	Getting to Know each other & Class Member Database		H1 assigned
Sep 1	The Problems – Start Database Thinking Today	EN6, Ch1&2	H1 due on Wed
	Database Concepts		H2 assigned
Sep 8	Entity-Relationship Models (Guest Lecturer)	EN6, Ch7	H2 due on Wed
	Entity-Relationship Models		P1 assigned
Sep 15	ER Models in MySQL	EN6, Ch8	
	Extended ER Models		H3 assigned
Sep 22	Relational Model	EN6, Ch3&9	H3 & P1 due on Wed
	ER-DB Mapping		H4 & P2 assigned
Sep 29	SQL DDL	EN6, Ch4	H4 due on Wed
	SQL DML		H5 assigned
Oct 6	SQL DDL & DML		H5 due on Wed
	Mid-term Review Session		

Oct 13	Class Project Mid-term Presentation and Discussion		P2 due on Wed
	MID-TERM EXAM		P3 assigned
Oct 20	FALL BREAK		
Oct 27	Advanced SQL	EN6, Ch5	
	Advanced SQL		H6 assigned
Nov 3	SQL Practice and Design		H6 & P3 due on Wed
	SQL Practice and Design		P4 assigned
Nov 10	Functional Dependencies and Normalization	EN6, Ch15	
	Functional Dependencies and Normalization		H7 assigned
Nov 17	Working in a Database Company (Guest Lecturer) (TBD)		H7 due on Wed
	Additional Database Topics		
Nov 24	THANKSGIVING BREAK		P4 due on Wed
Dec 1	**CLASS PROJECT PRESENTATION**		
	Final Review Session		
Dec 20	**FINAL EXAM AT 12:00 PM**		

* In the table, "H1" stands for "Homework Assignment 1"; "P1" stands for "Project Deliverable 1"; and so on. Homeworks and project deliverables are due on the Wednesday BEFORE the Thursday class, before 2:00 p.m.

* The instructor reverses the right to make changes to the syllabus. The changes will be announced as early as possible.

Special Accommodations

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

Acknowledgements

The design, materials, and implementation of this course is the product of a collaborative effort of SILS database instructors. Special Thank You to Professor Cliff Missen, Dr. Stephanie Haas and Dr. Robert Capra for their contribution to this class and this syllabus.