

Syllabus

INLS 523_02W, Fall 2014, Database Systems I Online, Fall 2014, Stephanie W. Haas

Instructor

Stephanie W. Haas
shaas at unc dot edu

Acknowledgements

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Course Description

INLS 523: Database Systems I: Introduction to Databases (3 credits)

Prerequisite:

Undergraduates: INLS 161 (formerly 261) or equivalent.

Graduates entering SILS in Summer/Fall 2013 (under the new curriculum): Satisfactory completion of the SILS Information Technology Competency Requirement OR INLS 161.

Graduate students who entered SILS prior to Summer/Fall 2013 (under the old curriculum) INLS 461 or equivalent.

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

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, the relational model, SQL, normalization and data quality, and emerging technologies.

Course Outline

Startup
Introduction and Database Concepts
Entity-Relationship Models
Relational Theory and Concepts
SQL
Relational Algebra
Functional Dependencies and Normalization
Wrapping up and Looking ahead

Learning Objectives

- Understand the basic concepts of databases, with emphasis on the relational model
- Gain experience with both the theoretical and practical aspects of database design and implementation.
- Develop proficiency with entity-relationship modeling.
- Be able to weigh, discuss, and justify database design decisions.
- Learn how to use SQL to create, manipulate and query databases
- Apply practical techniques for improving database design quality

- Gain an understanding of important ideas for databases in the future

Policies on Academic Integrity and Diversity

Chapel Hill has had a student-administered honor system and judicial system for over 100 years. Because academic honesty and the development and nurturing of trust and trustworthiness are important to all of us as individuals, and are encouraged and promoted by the honor system, this is a most significant University tradition. More information is available at <http://studentconduct.unc.edu/honor-system>

The UNC Honor Code is in effect for all work in this course. The “Instrument of Student Judicial Governance” gives examples of actions that constitute academic dishonesty: http://studentconduct.unc.edu/sites/studentconduct.unc.edu/files/2012_2013_Instrument.pdf#academicdishonesty

Students often ask what is okay to talk about with other students and what is not. There are some specific guidelines for this course.

- I do encourage you to help each other learn the course material – your fellow students can often be a great resource for learning. However, you should not discuss the details of a solution to an ongoing assignment with other students, and should never copy or share answers for an assignment with other students. It is okay to talk about course material with other students, but you should not discuss solutions to pending assignments.
- All work you submit should be your own.
- You may give and receive assistance regarding the use of hardware and software. For example, you may ask or answer a question such as "how do I [fill in the blank] in SQLite?"). A question such as "Should I have a separate table to represent cats and their information?" should be addressed to me.
- Individual homework assignments are to be done **individually**. You may consult the course materials, your notes, and even other print or web sources. (Keep in mind, however, that what you find in other sources may not be consistent with what I want you to do.) You may not consult your classmates or other people; all questions should be addressed to me.
- You must sign (check) the honor statement when you submit each assignment. This confirms that you and the work conforms to the Honor Code.

In support of the University's diversity goals and the mission of the School of Information and Library Science, SILS embraces diversity as an ethical and societal value. We broadly define diversity to include race, gender, national origin, ethnicity, religion, social class, age, sexual orientation and physical and learning ability. As an academic community committed to preparing our graduates to be leaders in an increasingly multicultural and global society we strive to:

- Ensure inclusive leadership, policies, and practices;
- Integrate diversity into the curriculum and research;
- Foster a mutually respectful intellectual environment in which diverse opinions are valued;
- Recruit traditionally underrepresented groups of students, faculty and staff; and
- Participate in outreach to underserved groups in the State.

The statement represents a commitment of resources to the development and maintenance of an academic environment that is open, representative, reflective and committed to the concepts of equity and fairness.

Grading Policies

The following grade scale will be used AS A GUIDELINE (subject to any curve) **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% | A <u>totally acceptable</u> performance 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% | A <u>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, an <u>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. |

*Definitions are from: <http://registrar.unc.edu/academic-services/grades/explanation-of-grading-system/> (underlining is my emphasis)

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

| Grade Range | Definition* |
|----------------|-------------|
| H 95-99% | High Pass |
| P 80-94.9% | Pass |
| L 70-79.9% | Low Pass |
| F 0-69.9.9% | Fail |

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

Due Dates and Late Work

Each assignment has a due date and time and includes instructions for submission. A late penalty of 5% per day will be applied unless prior arrangements have been made with the instructor. Assignments submitted more than 5 days after the due date will receive no credit and will not be graded.

Requests for Extensions

If you have a real problem submitting an assignment on time, please contact me *before* the due date. Getting a late start on an assignment does not count as a real problem. Any request for an extension must be made, preferably by email, at least 24 hours prior to the due date. If an emergency arises that prevents you from contacting me in advance, you must do so as soon as possible.

Grade Components

- Practice exercises, 4% of final grade
- Discussion topics, 4% of final grade
- Assignments, 40% of final grade
- Project, 22% of final grade

The Assignment Overview provides additional information about the work for this course.

Course Communications

Course announcements

Announcements will be posted on Sakai. Announcements may include information about the week's work, or other timely information.

Messages

I may use the message tool to send individual messages to you; I may also copy the message to your email address. You can also use the tool to send a message to me.

Email

Email is the best way to contact me.

Note that I receive a large amount of email and while I try to reply to student emails within 48 hours, there are times that it may take me 2-3 days to reply. Therefore, it is important that you get started on assignments early, so there is time for me to respond to any questions you may have. I cannot guarantee that I will be able to answer last-minute questions (e.g., within 2 days of the assignment due date).

Chat

We can use the Sakai Chat tool for scheduled "office hours", which are open to everyone, or individual consultation.

Sakai

All enrolled students should have access to the UNC Sakai site for this course: <http://sakai.unc.edu/>

We will use Sakai for almost all course activities.

Course Materials

All materials can be found in Sakai. The course syllabus, schedule, and information about tools and other resources will be there at the beginning of the semester.

Materials for each week are located in the **Modules** section of the Sakai site. I recommend that you work through each week's materials in the order they are listed. Unit materials, including videos and slides, exercises, and discussion topics will be published Monday mornings at 8:00 a.m. Once published, they will be available for you to study through the end of the semester.

Discussion Forum

We will use the Sakai discussion forum for a variety of interactions and exchanges. I will start some topics, for example, to pose questions or puzzles for you to discuss, to clarify assignments, or to respond to questions that I think are of general interest. You can also start topics, for example, to start a discussion about current issues or news involving databases, or asking a question of general interest about course content.

The Discussion Overview provides additional information about the discussions for this course.

Assignments

All Practice Exercises, Assignments, and Project Deliverables must be using the Sakai Assignments tool. In my experience, Sakai is a reliable method for submitting assignments. It is the responsibility of each student to make sure they have access to Sakai and can submit assignments when they are due.

If for some reason you are unable to submit an assignment to Sakai, as a last resort you may email it to me 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.

Drop Box

You each have a drop box in Sakai that is accessible only to you and me. You may store work in progress here. If you have a question about an assignment, and it would be helpful for me to see your work, you may store the draft in your drop box, and refer to it in your emailed question. I will look at only that file to respond to your question.

Do NOT submit homework by putting it into your drop box; all assignments should be submitted in the assignment.

Quizzes

Quizzes will be administered using the Tests & Quizzes Tool. Each of the 8 quizzes covers material from 1 topic; in other words, they are not cumulative over several topics. Quizzes will be published Sunday at 8:00 a.m. and must be completed by Tuesday 11:55 p.m. You may take the quiz at any time during that period, but once you have started, you must complete it in one sitting. Quizzes are designed to take approximately 15-30 minutes.

Schedule
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This DRAFT Schedule outlines the major topics and events planned for the semester. See the Unit Modules in the Sakai site for details.

1. Tuesday 8/19/14. Startup and Introduction

Material: Video & slides

Self-check:

Discussion: Introduce yourself to the class

Database Experience Survey (ungraded) **due Friday 8/22/14, 11:55 p.m.**

Assignment: Assign A1, Startup, **due Tuesday 8/26/14, 11:55 p.m.**

2. Monday 8/25/14. Database Concepts

Material:

1. Video & slides

2. Read Elmasri & Navathe, Ch. 1 & Ch. 2

Self-check:

Practice Exercise: **due no later than Sunday 8/31/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 9/2/14 11:55 p.m.**

Quiz: DB Concepts, **due no later than Wednesday 9/3/14, 11:55 p.m.**

Project: Assign Deliverable 1 (requirements, use cases, questions) **Due Tuesday 9/9/14, 11:55 p.m.**

A1, Startup, due Tuesday 8/26/14, 11:55 pm

3. Monday 9/1/14. Entity-Relationship Models (1)

Material:

1. Video & slides

2. Read Elmasri & Navathe, Ch. 7

Self-check:

Practice Exercise: **due no later than Sunday 9/7/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 9/9/14 11:55 p.m.**

4. Monday 9/8/14. Entity-Relationship Models (2)

Material:

1. Video & slides

2. Review Elmasri & Navathe, Ch. 7

Self-check:

Practice Exercise: **due no later than Sunday 9/14/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 9/16/14 11:55 p.m.**

Quiz: ER creation, interpretation, **due no later than Wednesday 9/17/14, 11:55 p.m.**

Assignment: Assign A2, ER model, **due Tuesday 9/23/14, 11:55 p.m.**

Project Deliverable 1, due Tuesday 9/9/14, 11:55 p.m.

5. Monday 9/15/14. Extended ER Models

Material:

1. Video & slides

2. Read Elmasri & Navathe, Ch. 8.0-8.3 (specialization and generalization) 8.5.1-8.5.2 (example);
8.7 (optional, helpful to those interested in knowledge representation)

Self-check :

Practice Exercise: **due no later than Sunday 9/21/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 9/23/14 11:55 p.m.**

Quiz: EER **due no later than Wednesday 9/24/14, 11:55 p.m.**

Project: Assign Project Deliverable 2 (ER), **due Tuesday 10/7/14, 11:55 p.m.**

6. Monday 9/22/14 Relational Concepts

Material:

1. Video & slides
2. Read Elmasri & Navathe, Ch. 3

Self-check:

Practice Exercise: **due no later than Sunday 9/28/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 9/30/14 11:55 p.m.**

Quiz: Relational concepts, **due no later than Wednesday 10/1/14, 11:55 p.m.**

A2 due Tuesday 9/23/14, 11:55 p.m.

7. Monday 9/29/14. ER-DB Mapping

Material:

1. Video & slides
2. Read Elmasri & Navathe, Ch. 9, Relational DB Design by ER and EER to Relational Mapping

Self-check:

Practice Exercise: **due no later than Sunday 10/5/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 10/7/14, 11:55 p.m.**

Quiz: ER-DB Mapping, **due no later than Wednesday 10/8/14, 11:55 p.m.**

Assignment: Assign A3 Mapping, **due Tuesday 10/14/14, 11:55 p.m.**

8. Monday 10/6/14. Basic SQL (1)

Material:

1. Video & slides
2. Read Elmasri & Navathe, Ch. 4.1-4.2

Self-check:

Practice Exercise: **due no later than Sunday 10/12/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 10/14/14, 11:55 p.m.**

Project Deliverable 2 due Tuesday 10/7/14, 11:55 p.m.

9. Monday 10/13/14. Basic SQL (2) (Fall Break Thursday & Friday)

Material:

1. Video & slides
2. Read Elmasri & Navathe, Ch. 4.3-4.4

Self-check:

Practice Exercise: **due no later than Sunday 10/19/14, 11:55 p.m.**

Quiz: Basic SQL, **due no later than Wednesday 10/22/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 10/21/14, 11:55 p.m.**

Assignment: Assign Assignment 4 SQL: **due Tuesday 11/4/14, 11:55 p.m.**

Project: Assign Project Deliverable 3, **due Tuesday 10/28/14, 11:55 p.m.**

A3, Mapping due Tuesday 10/14/14, 11:55 p.m.

10. Monday 10/20/14. Advanced SQL (1)

Material:

1. Video & slides
2. Read Elmasri & Navathe, Ch. 5

Self-check:

Practice Exercise: **due no later than Sunday 10/26/14, 11:55 p.m.**

Discussion: **due no later than Tuesday 10/28/14, 11:55 p.m.**

11. Monday 10/27/14. Advanced SQL (2)

Material:

1. Video & slides
2. Review Elmasri & Navathe, Ch. 5

Self-check:

Practice Exercise: due no later than Sunday 11/2/14, 11:55 p.m.

Discussion: due no later than Tuesday 11/4/14, 11:55 p.m.

Quiz: Advanced SQL, due no later than Wednesday 11/5/14, 11:55 p.m.

Project Deliverable 3 Due Tuesday 10/28/14, 11:55 p.m.

12. Monday 11/3/14. Relational Algebra

Material:

1. Video & slides
2. Read Elmasri & Navathe Ch. 6.1-6.5

Self-check:

Practice Exercise: due no later than Sunday 11/9/14, 11:55 p.m.

Discussion: due no later than Tuesday 11/11/14, 11:55 p.m.

Project: Assign Project Deliverable 4, due Tuesday 12/9/14, 4:00 p.m.

A4, SQL due Tuesday 11/4/14, 11:55 p.m.

13. Monday 11/10/14. Good Design, Functional Dependencies

Material:

1. Video & slides
2. Read Elmasri & Navathe Ch. 15.1 & 15.2

Self-check:

Practice Exercise: due no later than Sunday 11/16/14, 11:55 p.m.

Discussion: due no later than Tuesday 11/18/14, 11:55 p.m.

14. Monday 11/17/14. Functional Dependencies, Normalization

Material:

1. Video & slides
2. Read Elmasri & Navathe Ch. 15.3 & 15.4

Self-check:

Practice Exercise: due no later than Sunday 11/23/14, 11:55 p.m.

Discussion: due no later than Tuesday 11/25/14, 11:55 p.m.

Quiz: Functional Dependencies and Normalization, due no later than Wednesday 11/26/14, 11:55 p.m.

Assignment: Assign A5, Functional Dependencies and Normalization, due Tuesday 12/2/14, 11:55 p.m.

15. Monday 11/24/14. Data Quality and Wrap-up

(Thanksgiving break starts Wed 11/26/14, Classes end Wednesday 12/3/14. This unit covers both short weeks.)

Material:

1. Video & slides

Self-check:

Practice Exercise: due no later than Tuesday 12/2/14, 11:55 p.m. **Different due date!**

Discussion: due no later than Tuesday 12/2/14, 11:55 p.m.

A5, FD and Norm, due Tuesday 12/2/14, 11:55 p.m.

Tuesday 12/9/14, 4:00 p.m., Final Exam Scheduled

Project deliverable 4 due Tuesday 10/28/14, 11:55 p.m.