

INLS 523-002 Intro to Databases

Schedule: Tuesday and Thursday, 9:30-10:45am in Manning 304

Sakai Site: https://sakai.unc.edu/portal/site/exciting_database_class

Instructor: Eric Chernoff, eric_chernoff@unc.edu

Office hours: I will be in Manning Hall for 15-30 minutes after each class. I am also available to meet by appointment. I will respond to emails and messages within 24 hours.

Course Overview

Hopefully, this course will be a pleasant introduction to the wonderful world of database systems. By the end of the semester, you will have a solid understanding on:

1. Why databases are used and how they represent real world information.
2. How information is organized within relational databases.
3. The use of Structured Query Language (SQL) to retrieve, create, and update information in a relational database.
4. Best practices for designing relational databases in the professional world.
5. The use cases for document databases and NoSQL.

We will be using MySQL to explore these topics. You will learn a lot about MySQL, but the key concepts will apply to all relational database systems.

Mandatory Required Necessities

Before participating in this exciting course, all must students must have:

- Completed the required prerequisite INLS 161.
- A proper laptop with a SSH client.
- Access to Sakai to submit the assignments and access the course materials.

Optional / Recommended Textbook

- Murach's MySQL 3rd Edition (Joel Murach, ISBN 978-1-943872-36-7)

Grading / Expectations

While I am friendly and often entertaining, this is a very important course for your education and career. We will have fun, but everyone is expected to attend class, be on-time, participate, leave smart devices locked, and treat one another respectfully.

Much of our class time will be interactive lectures with plenty of time for questions and discussion. Approximately one-third of the class time will be in-class labs and practice with small groups followed by discussion. The classes and assigned readings combine to allow you to accomplish the graded assignments. It will be very difficult to pass without attending class and attendance is expected. Only university-approved absences will be excused; please see <https://attendance.unc.edu/>. There is a difference between “understood” and “excused.”

The grading scale will be:

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| A = 90-100 | B = 80 - 89.9 | C = 70 - 79.9 | D = 60 - 69.9 | F = 0 - 59.9 |
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Note: Final scores ending in 0, 1, or 2 will be labeled with the ‘minus’, and scores ending with 8 or 9 will receive the plus label. (Exception: a 100 is an A+).

Your grade will be based on the following:

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| Weekly Assignments | 45% | Take home SQL exercises and design projects. |
| Midterm Exam Assignment | 15% | Take home SQL exercises and short-form essay questions. |
| Database Design Assignment | 15% | Take home medium-sized design project |
| Final Exam Assignment | 15% | Take home database design exercises and short-form essay questions. |
| Participation in Class Labs and Discussions. | 10% | Active collaboration with your lab partners, contributing your thoughts and ideas. Asking questions, and attending class. |

Our conduct in this class will be governed by the UNC Student Code of Conduct and UNC Honor Code. Information on both codes is available here: <https://studentconduct.unc.edu/>. While completing the assignments, please do make use of your notes, the textbox, and online reference sites (W3CSchools, Stackoverflow.com, MySQL.com, etc.). However, you must cite your sources and you may not copy-and-paste text into your essay. (I can tell. Use your own words.)

Your questions are welcome! Chances are someone else has the same question, so please ask for everyone's benefit. I am happy to answer questions in class, during office hours, and via email. I will broadcast many answers via Sakai Announcements, so help out your classmates.

Class Meeting Plan

The plan below is my most sincere intention, but is subject to change in the event of severe weather or if class discussions go long. Audio and video recording is not allowed without the instructor's written permission.

| Date | Class Plan |
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| Tues, 8/16 | Introduce this fantastic course, meet our wonderful classmates, and discuss the concept of databases. Brief history of database technology, then discuss how databases are used in the (real) world. |
| Thur, 8/18 | In-Class Lab & Discussion: Identifying entities and attributes in the real world. AKA: Maybe get some context for this gibberish. |
| Tue, 8/23 Thur, 8/25 | <p>Things that deserve capitalization for emphasis: Relational Database Concepts, Semantic Modeling and Entity Relationships.</p> <p>Suggested Reading: Murach's, pages 4-21 Assignment: Logging into the class database server</p> |
| Tue, 8/30 Thur, 9/1 | <p>Overview of relational databases, plus Why I Love the Structured Query Language (SQL)</p> <p>Suggested Reading: Murach's, pages 22-33, 66-69</p> |
| Tue, 9/6 | UNC Wellness Day - No Class |
| Thur, 9/8 Tues, 9/13 | <p>SQL Operators: <code>SELECT info FROM instructor WHERE will_be_on_exam = 'Yes' AND (importance > 10 OR is_boring = 'No');</code></p> <p>Suggested Reading: Murach's, pages 74-103 Assignment: Basic Querying Tasks</p> |
| Thur, 9/15 Tues, 9/20 | <p>You too can be a SQL guru: Clauses, Order-by, Limit, Grouping (Aggregation)</p> <p>Suggested Reading: Murach's, pages 104-109 and 170-183 Assignment: Intermediate Querying Tasks</p> |

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| Thur, 9/22 Tues, 9/27 | Table Joins along with Keys and Indexes. Suggested Reading: Murach's, pages 114 - 139 and 356-357 Assignment: Aggregate Querying Tasks |
| Thur, 9/29 | Reading is no fun without writing: SQL for creating, updating and deleting data. Suggested Reading: Murach's, pages 152 - 163 |
| Tues, 10/4 | Schema schemes: Column Data Types and SQL for defining tables (DDL) Suggested Reading: Murach's, pages 232-247 and 344-345 Assignment: Basic Join Queries |
| Thur, 10/6 Tues, 10/11 | Don't be sad -- your favorite SELECT can live forever! Creating Table Views (virtual tables) Bonus: How to write slow SQL: Unions and sub-selects Suggested Reading: Murach's, pages 382-397; 200-211 |
| Thurs, 10/13 | Review / Q&A Session for Midterm Exam Assignment Midterm exam opens after class. |
| Tues, 10/18 | 1:00pm Midterm exam assignment is due. |
| Thur, 10/20 | Fall Break / No Class |
| Tues, 10/25 Thur, 10/27 | The Three, Four, or Maybe Seven Forms of Database Normalization. Also, why does it need to be fast? Suggested Readings: Murach's, pages 306-331 https://blog.udemy.com/normalization-in-database-with-example/ |
| Tues, 11/1 Thur, 11/3 | Wisdom from the Oracle: ACID compliance and Database Transactions Suggested Reading: Murach's, pages 430-443; 42 -63 Assignment: Intermediate Join Queries |
| Tues, 11/8 | SQL is code too: All above Stored Procedures and Triggers Suggested Reading: Murach's, pages 402-425 |
| Thur, 11/10 | In-Class Design Lab #1 Assignment: Creating Normalized Tables |
| Tues, 11/15 | Calculating the right time to talk about date/time functions. |

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| | Suggested Reading: Murach's, pages 270-283 |
| Thur, 11/17 | In-Class Design Lab #2 Assignment: Advanced Join Queries |
| Tues, 11/22 | The class where we talk about Document Databases and NoSQL |
| Thur, 11/24 | Thanksgiving Break - No Class |
| Tues, 11/29 | Review / Q&A Session for Final Exam Assignment Assignment: Database Design Project Final exam assignment opens after class. |
| Tues, 12/6 | 2:00PM - FINAL EXAM ASSIGNMENT IS DUE - NO EXCEPTIONS |