

LIS 674: Database Design and Creation

University of Hawaii Library and Information Science Program

Fall 2018 | Mondays 5-7:30 | HL 3G

Instructor: Nathan Dwyer | ndwyer@hawaii.com | HL 002J

Office Hours: M 3:30 - 5:00 or by appointment

Course Description

From the catalog: Designing and creating textual and/or directory databases from the viewpoint of information specialists and content providers. Needs analysis, file design, record content and structuring, software choices. Students implement a prototype database.

This course addresses these SLOs from the LIS Program curriculum (<http://www.hawaii.edu/lis/about-us/student-learning-outcomes>):

- SLO4 Technologies: Evaluate and apply information technologies

Teaching Philosophy

This course will be a practical, hands-on introduction to real-world approaches and techniques of database design, focusing on three main areas: requirements gathering, data modeling, and formal specification. Classes will be highly participatory. You are expected to attend every class meeting and participate to the fullest extent of your ability. You should encourage and challenge the other students and the instructor to the same extent you hope to be encouraged and challenged.

Course Goals

- Have a basic understanding of information requirements gathering
- Present and defend a requirements-driven database specification
- Understand and balance trade-offs in database design choices
- Represent database specification in Entity-Relationship notation
- Communicate database technical designs and requirements
- Implement a simple relational database

Personal Conduct

Students are required to follow the highest standards of intellectual and personal honesty throughout their careers at the University of Hawaii, as stated in the LIS Program guidelines: (<http://www.hawaii.edu/lis/resources/professional-expectations>) and the Mānoa Student

Conduct Code (http://studentaffairs.manoa.hawaii.edu/policies/conduct_code), which “reaffirms the principle of student freedom that is coupled with an acceptance of responsibility for one’s actions and the consequences of such actions.”

Technology

As part of this course, you will implement a small database. You will need regular access to a laptop or computer on which you are able to install software. At no point in time during this class will you need a cell phone. Please silence them before class starts.

Kokua

If you need reasonable accommodations to complete required coursework because of the impact of a documented disability, you are encouraged to explore the services of UH Mānoa’s KOKUA program. KOKUA provides disability access services to individuals on a case-by-case basis, and students are not charged for these services. A student’s disability status is considered confidential information and is only disclosed to faculty with the student’s permission.

Support Services

Confidential student counseling and support services are available at the UHM Counseling and Student Development Center (CSDC), Queen Lili‘uokalani Center for Student Services, Room 312. More information is available at the CSDC website: <http://manoa.hawaii.edu/counseling>

Title IX is a federal civil rights law prohibiting discrimination and harassment in education. The UHM Office of Title IX has the specific responsibility for providing prompt and effective responses to all complaints of discrimination or harassment for faculty, staff and students. More information is available at the Office of Title IX website: <http://manoa.hawaii.edu/titleix>

Course Schedule (subject to change)

Date	Topic	Readings/Notes
8/20	Introductions, overview, purpose, goals. What is a database? What is design?	Database terminology
8/27	Identifying and expressing data needs: needs assessment, interviewing and listening Formalizing requirements	Semi-structured Interview
9/3	<i>No class (Labor Day)</i>	
9/10	Modeling individuals and communities	Usability tools,

	Describing information needs	Scenario-based design
9/17	Design specification tools: scenarios, personas, use cases Scope, limitations, and design tradeoffs	
9/24	Preliminary Project 1 presentations Evaluation, feedback, revision	
10/1	Project 1 Presentations, Project 1 Due Entity-Relationship Modeling	ER Modeling
10/8	More Entity-Relationship Modeling Query design, complexity analysis	Short Paper 1 Due
10/15	Preliminary Project 2 presentations Relational model, formal specification languages	
10/22	Project 2 Presentations, Project 2 Due SQLite3 setup, basic use. Intro to SQL, mapping entity-relationship models to SQL	SQLite , SQL
10/29	SQL! SQL! SQL! tables, joins, primary keys, indexes, foreign keys, constraints	Short Paper 2 Due
11/5	More SQL: queries	
11/12	<i>No class (Veterans' Day)</i>	
11/19	[Tentative] Other database types: graph (neo4j) and document (mongo)	Neo4j , MongoDB
11/26	Preliminary Project 3 presentations Real-world presentation and nerd pushback	
12/3	Project 3 Presentations, Project 3 Due Class wrap up	
12/6	<i>No class</i>	Short Paper 3 Due

Assignments (also subject to change)

You will be graded on three small group projects and three individual short papers.

Group Projects

You will work in small groups on projects for each of the main subject areas of the class. Each project will consist of a written paper and a presentation.

Project 1: Gather requirements and present a database proposal

Project 2: Produce a documented entity-relationship model

Project 3: Create the SQL to define and query a small database

Specific requirements for each project will be provided in class, but each will include:

- a written proposal for each project's assigned work
- a written paper demonstrating the techniques discussed in class
- a short group presentation of this proposal
- an honest, written self-evaluation of the work.

Short Papers

Papers will be written on topics of your choice in each of the three main subjects of the class.

For each paper, you should identify an interesting question or topic within the subject area and write a short paper that includes:

- an explanation of the question or definition of the topic
- a short exposition answering the question or providing information on the topic
- a brief bibliography

Short papers will be posted and shared with the rest of the class.

Specific requirements will be discussed during the first class.

Reading List (hopefully subject to a lot of change)

We'll accumulate interesting reading material here:

[LIS 674 Reading List](#)

Please either request access or send me your hawaii.edu email address as soon as possible.

I'll post things that I find interesting and germane, and you are encouraged to do the same. This will be lightly curated--I reserve the right to remove or edit anything in the doc.

Grading

Assignments will be graded on a 3 point scale:

- 3 - Exceptional. The work meets or exceeds all requirements
- 2 - Satisfactory. The work meets most of the requirements
- 1 - Unsatisfactory. The work does not meet most of the requirements
- 0 - Failing. The work does not meet any of the requirements.

Group projects will be weighted 3x the value of individual papers, and the final grade will be based on the weighted average of the assignment grades:

$$\text{Grade} = (3 * (\text{project1} + \text{project2} + \text{project3}) + (\text{paper1} + \text{paper2} + \text{paper3})) / 12$$

$$3.0 \geq A \geq 2.25 > B \geq 1.5 > C \geq 0.75 > F \geq 0.0$$

Submitting work

Assignments must be submitted on dates/times specified. Failure to submit high quality work by the deadline will imperil your ability to receive credit for the course.

Incompletes

Incomplete grades will not be issued. Students who are unable to complete the course this semester will receive a grade based on the work submitted.

Real Life

Life happens. If you're stuck, having trouble, or feel like you need a little more help with anything, please contact me sooner rather than later.