

Spring 2013

S511: Database design

Course Information

Course Time: Friday 9:30-12:15p

Class meet: January 11 - May 3, 2013

Location: LI002

Instructor: Ying Ding

Office Hours: Thursday 2-3:30pm or by appointment

Contact: Email: dingying@indiana.edu; Tel: 812-855-5388

Course Description

A database is an organized collection of related data. In modern organizations databases are used to support a wide-range of operations. Some common operations involve personnel management, inventory control, customer tracking, and marketing. Companies also use databases for analyzing consumer demands, service quality, and customer profiles.

The main goal of this course is to provide instruction in both fundamental principles and user-centric methodologies for effective creation of a complete and fully functional database management system. In order to do so, this course focuses on applications of basic database theories and SQL practices in different database systems.

Each class will start with a lecture followed by a lab session, where students will learn hands-on skills for designing and implementing database management systems.

The objectives of this course are:

- understand basic database concepts and theories.
- learn basic data modeling principles.
- apply relational modeling in database design.
- acquire hands-on experience with developing database management systems.

Prerequisite

- [S401](#) or consent of instructor
(To get the instructor's consent, email dingying@indiana.edu describing your relevant computer skills).
- Skills Needed for this course
 - basic PC (Windows O/S) skills
 - basic MS Access skills

Course Policy

- [The Honor Code](#) is in effect. Academic and personal misconduct by students in the class are defined and dealt with according to the procedures in the [Code of Student Ethics](#). The students must clearly indicate if they use materials from other sources, such as textbooks or Internet webpages. Full citation information must be given for such sources. Do your own work, and the knowledge will stay with you. Get it from others, and you will have to rely on them again. Within this guideline, you are free to discuss issues and exchange ideas with others.
- Late submission of assignment will be penalized for the sake of fairness to others who turned in their work on time. If you have a problem meeting the deadline, please discuss it with me in advance.
- Please resist the temptation to work with your computer during lecture and discussion. Paying full attention to what is being said will benefit you in the long run.

Course Materials

Textbook Recommended:

- Peter Rob and Carlos Coronel (2007). Database systems: Design, implementation, management (7th Edition). Thomson/Course Technology, ISBN:9781418835934(7th Edition), ISBN:9780538469685(9th Edition), 8th Edition is reserved at IU Library Media & Reserve Service Department (<http://www.libraries.iub.edu/index.php?pageId=307>) under Prof. Ding's personal reservation [short name: RC]
- Robert J. Muller (1999). Database Design for Smarties: Using UML for Data Modelling. San Francisco: Morgan Kaufmann (ISBN: 1558605150). One copy is reserved at IU Library Media & Reserve Service Department (<http://www.libraries.iub.edu/index.php?pageId=307>) under Prof. Ding's personal reservation [short name: RM]
- Rob Stephens (2008). Beginning Database Design Solutions. Hoboken: Wrox (ISBN: 9780470385494). One copy is reserved at IU Library Media & Reserve Service Department (<http://www.libraries.iub.edu/index.php?pageId=307>) under Prof. Ding's personal reservation [short name: RS]
- Neil Matthew and Richard Stones (2005). Beginning databases with PostgreSQL: From novice to professional. APress (ISBN: 9781590594780). One copy is reserved at IU Library Media & Reserve Service Department (<http://www.libraries.iub.edu/index.php?pageId=307>) under Prof. Ding's personal reservation [short name: NW+RS]
- Tom Jewett (2011). Database Design with UML and SQL, URL: <http://www.tomjewett.com/dbdesign>

Recommended Readings:

- SQL Tutorial: <http://www.sqltutorial.org/default.aspx>
- SQL ZOO: <http://sqlzoo.net/>

Software:

- MS Access 2010, free available campus-wide including SLIS Tech Lab
- PostgreSQL is free software, can be downloaded at <http://www.postgresql.org/ftp/source/v9.0.4/>. It is also available at SLIS Tech Lab. The online access (phpPgadmin) is available at <https://ella.slis.indiana.edu/adm/phpPgadmin/>
- MySQL is free software, can be downloaded at <http://www.mysql.com/downloads/mysql/>. Some recommended GUI browser: [Aqua Data Studio](#) (available in the SLIS Tech Lab), <http://www.navicat.com/>, <http://www.webyog.com/en/downloads.php>.
- Oracle: install Oracle client at IU at <http://kb.iu.edu/data/anh1.html>, and use SQL*Plus to access Oracle OED1PRD database at <http://kb.iu.edu/data/anh1.html>
- Oxygen XML editor: available in SLIS Tech Lab, free available at IU ([download](#))

Course Schedule

Date	Lecture	Lab	Assignments
Week1: Jan 11	Course Overview	MS Access , Instruction to VMware Reading (optional): <ul style="list-style-type: none"> • RM: Ch1-3 	Explore Oncourse site
Week2: Jan 18	Database Overview	Database System , Lab2 Slides Reading (optional): <ul style="list-style-type: none"> • RC: Ch2 (section1-4) • NW+RS: Ch1, Ch5 • RS: Ch2 	Homework #1 ; (due: week3) (ER Diagram Notation); Project: form project teams, find project topic
Week3: Jan 25	Database Design	Database Design , Lab3 Slides	Homework #2 (due: week4); Project: Project team formed (send the title, short description)

		<p>Reading (optional):</p> <ul style="list-style-type: none"> • RC: Ch9 • NW+RS: Ch3, 12, Appendix B • RS: Ch4, 5 	<p>of your project and contact info of team members to TA (due:week4)), work on Project Description(Sample)</p>
<p>Week4: Feb 1</p>	<p>Relational Database Model</p>	<p>Relational Database Model, Lab4 Slides</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • RC: Ch3 • NW+RS: Ch2, 4 • RS: Ch3 	<p>Homework #3 (due:week5), Working on Project Specification.</p>
<p>Week5: Feb 8</p>	<p>ER Modeling</p>	<p>ER Modeling</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • RC: Ch4, 5 • NW+RS: Ch6 • RS: Ch6-14 	<p>Homework #4 (due: week7); Project: work on Project Specification (mid-term)(due: week9), work on data model</p>
<p>Week6: Feb 15</p>	<p>UML</p>	<p>UML and SQL</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • RM: Ch4-11 	<p>Project: using UML to draw the digrams for your group project (Information flow chart, ER diagram, UML diagram)</p>
<p>Week7: Feb 22</p>	<p>SQL - Basic and Advanced</p>	<p>SQL Tutorial SQL: http://www.sqltutorial.org/converting_differnt_quotes</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • NW+RS: Ch3-4, Ch7 • RS: Ch17 	<p>Project: SQLs for your group project</p>
<p>Week8: March 1</p>	<p>SQL-Function and Datatype</p>	<p>http://sqlzoo.net/</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • RS: Ch8, Appendix B+C 	<p>Project: SQLs for your group project</p>
<p>Week9: March 8</p>	<p>SQL in Access: Lecture, Lecture MS Access file</p>	<p>Access SQL Example 1, Example 1 Access File, Access SQL Example 2, Example 2 Access File, Access SQL code, MS Charter Example</p> <p>Reading (optional):</p> <ul style="list-style-type: none"> • RS: Ch15 	<p>Project: Work on group project; Other MS Access lab materials: Table, Form, Query, Database 1, Database 2, Database 3, Database 4</p>
<p>week10:</p>	<p>Spring Break</p>		

March 15			
Week11: March 22	SQL in PostgreSQL I, PostgreSQL@SLIS IU, order file	PostgreSQL Lab (Class Example , PostgreSQL@SLIS IU , Class file) Reading (optional): <ul style="list-style-type: none">http://www.postgresql.org/docs/	Homework 5 (due: week13): Create your own PostgreSQL example with more than 3 tables. Please generate 10 SQL queries including at least one example for each of the following types of queries: subquery, group by query and join table query. Query results should be shown in screenshots. Please compile database ER diagram, table dictionary, 10 SQL queries and query results in a ppt file and submit this ppt file along with the SQL dump of your database to the oncourse, see one example); Project: Working on your group project
Week12: March 29	SQL in PostgreSQL II, PostgreSQL@SLIS IU, sproc file	PostgreSQL Lab (IVL Example , and IVL file , how to load SQL dump through phppgadmin (optional)) Reading (optional): <ul style="list-style-type: none">http://dev.mysql.com/doc/	Project: Working on your group project
Week13: April 5	Guest lecture on Oracle, Oracle Lab (Oracle , Oracle example)	Optional: MySQL Lab (SQL in MySQL , MySQL file , Aqua Data Studio)	Project: Working on your group project
Week14: April 12	XML database	XML exercise	Project: Working on your group project
Week15: April 19	XML Query ,	XML Path and Query	Project: Finalizing your group project
Week16: April 26	Group Project Presentation and Demo		
Week17: May 3		Final version of database due, Final project report due	Course Feedback (optional)

Homework and Class Exercise

There are five assignments, final project presentation and participation of class activities.

[S511 Assignments](#)

Grading (see assignments for details)

The grades are given according to the SLIS grading standards. Good work that meets the course expectations will be assigned a grade of B. To get a higher grade than B, the students must demonstrate above average comprehension of the course materials, knowledge and/or effort.

- [Group Project](#), 50%
 - Project Specifications, 20%
 - Completed Database System, 20%
 - Project Presentation & Demo, 10%
- General Assignments, 50%
- class feedback, extra credit

SLIS Grading Policy

The following definitions of letter grades have been defined by student and faculty members of the Curriculum Steering Committee and have been approved by the faculty as an aid in evaluation of academic performance and to assist students by giving them an understanding of the grading standards of the School of Library and Information Science.

A	4.0	Outstanding achievement. Student performance demonstrates full command of the course materials and evinces a high level of originality and/or creativity that far surpasses course expectations.
A-	3.7	Excellent achievement. Student performance demonstrates thorough knowledge of the course materials and exceeds course expectations by completing all requirements in a superior manner.
B+	3.3	Very good work. Student performance demonstrates above-average comprehension of the course materials and exceeds course expectations on all tasks as defined in the course syllabus.
B	3.0	Student performance meets designated course expectations and demonstrates understanding of the course materials at an acceptable level.
B-	2.7	Marginal work. Student performance demonstrates incomplete understanding of course materials.
C+	2.3	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course materials.
C	2.0	
C-	1.7	Unacceptable work. Coursework performed at this level will not count toward the MLS or MIS degree. For the course to count toward the degree, the student must repeat the course with a passing grade.
D+	1.3	
D	1.0	
D-	0.7	
F	0.0	Failing. Student may continue in program only with permission of the Dean.

To receive a passing grade in this course, you must turn in all of the assignments and the term project and do your presentation. You cannot pass this course without doing all of the assigned work, however, turning in all of the work is not a guarantee that you will pass the course. Grades of I (Incomplete) may be assigned in this course after discussion with the instructor, but depending on the circumstances, there will be a penalty applied at the discretion of the instructor.

All papers and assignments must be submitted on the dates specified in this syllabus. If you cannot submit an assignment or cannot deliver a presentation on the date it is due, it is your responsibility to discuss your situation with the instructor, preferably in advance. Given that your reasons or problems are legitimate, arrangements for the completion of the outstanding work can be made; this will occur, however, at the discretion of the instructor.

There will be a penalty for work turned in after the assigned date, and this will also be applied at the discretion of the instructor. Your written, web-based, and oral work will be evaluated according to four criteria; it must:

- Be clearly written, marked up, and/or presented, and spell- and grammar-checked;
- Demonstrate a degree of insight into the concepts, issues, and trends in both the areas you investigate in the assignments and in the course content;
- Demonstrate a degree of originality in your reviews, analyses and projects; and
- Display some familiarity with the appropriate current and/or classic literatures where appropriate.

Borderline grades will be decided (up or down) on the basis of class contributions and participation throughout the semester.