

San José State University
College of Science
Department of Computer Science
CS 157A, Introduction to Database Management Systems
Sections 3 and 4
Fall 2016

Course and Contact Information

Instructor:	Tsau-Young Lin
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Office Hours:	Section 3: TR 17:30-18:00 Section 4: TR 19:15-20:15 Friday (appointment only)
Class Days/Time:	Section 3: TR 18:00 – 19:15 Section 4: TR 19:30 – 20:45
Classroom:	MH 222
Prerequisites:	CS 146 (with a grade of "C-" or better) or instructor consent

Course Description

Current, classical database systems. Entity-relationship and enhanced entity models. Relational model, algebra, calculus. Current, emerging SQL standard. Embedded, Dynamic SQL. Application perspective on transactions and security. Interactive and programmatic interfaces to database systems. Application programming project using commercial database system.

Course Objectives

- Elementary database modeling including relational model, algebra and constraints
- Data anomaly and database design theory (data anomaly, normalization)
- Current, emerging SQL standard including embedded and dynamic SQL.
- Interaction between DBMS and a third generation programming language, mainly on Java or C.
- The skill to organize a team project (using waterfall model) to build a “real world” database system that is based on a commercially available DBMS, such as Oracle, DB2, SQL Server and etc. and a third generation programming language, such as Java and C.

Course Learning Outcomes

Important topics, database design theory and diagnosis are added.

1. Student learning outcomes: Upon successful completion of this course, students should have a knowledge on

- the basic of system and user aspects of database systems.
- the basic of database modeling including relational model, relation algebra and constraints, such as key constraints
- the basic of database diagnosis and design theory (discovering the data anomaly and normalizations)
- the basic skill in writing SQL, including embedded and dynamic SQL.

2. Programming outcomes:

- to use commercially available DBMS, such as Oracle, DB2, MS SQL Server and (we will use MS SQL Server)
- to handle the interactions between DBMS and a third generation programming language, such as Java, C++.
- Ability to organize a team project (using waterfall model) to verify and validate a “real world” big data system (complexity is near a real world database system) that is based on a DBMS and a programming language

Required Texts/Readings

Textbook

Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer D. Widom.

Database Systems: The Complete Book. Prentice Hall. 2nd Ed ISBN-13: 978-0131873254. 2008.

Other Readings

MS SQL (Murach's SQL Server 2016 for Developer by B. Syverson and J. Murach)

Course Requirements and Assignments

1. Projects: Understand “our” Concept Mining Engine that include a MapReduce component
2. Exams: 4 exams
3. Quizzes: Many unscheduled quizzes. Missing quizzes (up to 4 quizzes) can be made up by attending public technical talks sponsored by professional organizations, such as IEEE, ACM, AMS, and etc.
4. Homework: Short SQL 's to enhance the understanding of lectures
5. Class Participation: Present some interesting topics in class, give some demos of short programs, or explaining hard home works in class will be properly awarded.

Final Examination or Evaluation

[University Policy S06-4](http://www.sjsu.edu/senate/docs/S06-4.pdf) (<http://www.sjsu.edu/senate/docs/S06-4.pdf>) An accumulative exam that includes lectures and project will be given at the time scheduled by the university.

Determination of Grades

Projects & home works	30%
Exams	30%
Quizzes (Class average set 80 linearly)	10%
Final Exam (include lecture and project)	30%
Total	100%
90-92; 93-96;97-100	A
80-82; 83-86;87-89.99	B
70-72; 73-76;77-79.99	C
60-62; 63-66;67-69.99	D
<60	F

Classroom Protocol

I expect you to arrive promptly for every class meeting. If you do come in late, please take a seat quietly. Do not talk on a cell phone during class. If your phone rings, turn it off or leave the room. I would appreciate it if you would refrain from talking to your neighbors while I am talking or while a classmate is trying to talk to me. A lot of people making tiny noises makes it very hard for me to hear.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1		First day of class Thursday; Overview of class policies and project description
2		Database system and “abc” of MS SQL Server.
3		Relational data model An Overview of Data Models; Basics of Relational Model; Defining a Relation Schema in SQL Defining a Relation Schema in SQL Demo: installation of oracle.
4		Relational data model Defining a Relation Schema in SQL; algebraic query language oracle SQL (create new relation; insert data)
5		Relational data model; algebraic query language
6		Relational data model; Constrains on relations
7		The Database language SQL;

Week	Date	Topics, Readings, Assignments, Deadlines
8		The Database language SQL;
9		The Database language SQL;
10		The Database language SQL (Optimization)
11		The Database language SQL (Optimization)
12		Design Theory for Relational databases;
13		Design Theory for Relational databases;
14		Design Theory for Relational databases;
15		Design Theory for Relational databases; SQL (Optimization)
16		Review; Exam 3
17		Secondary Storage Management; The Memory Hierarchy; Disk
18		Exam 4
19	Section 3: Thursday, December 15, 1715-1930 Section 4: Thursday, December 15, 1945-2200	Final Exam