

San José State University
Department of Computer Science
Fall Semester 2018

CS 157A – Introduction to Database Management Systems, Section 6

Course and Contact Information

Instructor: Ahmed Ezzat
Office Location: MH-218
Email: Ahmed.Ezzat@sjsu.edu
Office Hours: Tu + Th: 10:00AM – 11:00am (only by advanced reservation)
Class Hours: Tu + Th: 4:30PM – 5:45PM
Classroom: Duncan Hall-135
Prerequisites: CS 146 (Data Structures and Algorithms) with a grade of C- or better, or instructor's consent. The Department of Computer Science strictly enforces prerequisites. The instructor may drop any student who does not show up for the first two class meetings without providing a valid excuse ahead of time.
Grader: Aseem Chhabra **Email:** aseem.chhabra@sjsu.edu

Course Description

Introduction to Database Management Systems

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. Prerequisite: CS 146 (with a grade of "C-" or better); Computer Science, Applied and Computational Math, or Software Engineering majors only; or instructor consent.

Course Learning Outcomes (CLO)

Upon successful course completion, students would achieve the following:

- Know the algorithms for testing if a decomposition is in a given specific Normal Form (NF). Given a set of Functional Dependencies (FD), Know the algorithms to do a table decomposition into BCNF, 3NF and 4NF.
- Write SQL commands to create database, create table, Insert/Update/Delete/Query rows in a database system.
- Ability to load data into the database.
- Being able to write relational algebra queries and predict what the query will return from a given database instance.

- Write simple transaction using JDBC or similar application programming interface (API).
- Understand the different flavors of SQL engines (OLTP vs Data Warehouse).
- Understand at high-level the differences between SQL and NoSQL databases.

Required Texts/Readings

- Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer D. Widom, "**Database Systems: The Complete Book**," Prentice-Hall, 2nd Edition, 2009, ISBN-13: 978-0-13-606701-6 [Mandatory]. Online Copy: http://people.inf.elte.hu/nikovits/DB2/Ullman_The_Complete_Book.pdf

Recommended texts for self-study

- C. Date, "**An Introduction to database Systems**," Addison Wesley, 8th Edition, 2003, ISBN-13: 978-0-32-119784-9 [Optional].
- Ramez Elmasri and Shamkant B. Navathe, "**Fundamentals of Database Systems**," Addison Wesley, 5th Edition, 2006, ISBN-13: 978-0-32-136957-4 [Optional].

Course Requirements and Assignments

All the assignments and related documents must be handed in the classroom on due date. Students will lose 10% of the homework or project grade for each day delay, and after 5 days, homework or projects will not be accepted.

Homeworks are solved individually and projects are implemented in Groups. Homework and Project descriptions are available on Canvas

- Homework-1: [Assignment is on Aug 28, 2018, and is due back on Sept. 13, 2018.](#)
- Homework-2: [Assignment is on Sept. 18, 2018, and is due back on Oct 9, 2018.](#)
- Homework-3: [Assignment is on Oct. 23, 2018, and is due back on Dec. 4, 2018.](#)

Project: [Assignment is on Nov. 1, 2018, and is due back on Dec. 4, 2017.](#)

Exams or Evaluation

The midterm and final examinations will be closed book and no notes. There will be no laptops, or any personal digital devices allowed. There will be no make-up exams. If a student misses an exam without a legitimate excuse, a grade of zero will be recorded. If a student missed an exam with a legitimate excuse then the grade for that exam will be prorated. More details can be found on final examination in [University Policy S06-4](http://www.sjsu.edu/senate/docs/S06-4.pdf) (<http://www.sjsu.edu/senate/docs/S06-4.pdf>) which states that "There shall be an appropriate final examination or evaluation at the scheduled time in every course, unless specifically exempted by the college dean who has curricular responsibility for the course."

Grading Information

Your individual class grade will be weighted as follows:

- Assignments 15% 15 points individual scores
- Project 20% 20 points Group scores
- Quizzes / Participation 5% 5 points individual scores
- Midterm 30% 30 points individual scores
- Final exam 30% 30 points individual scores

Each assignment, project, and exam will be scored (given points) but not assigned a letter grade. The mean score will be announced after each exam.

Determination of Grades

Final individual class letter grades will be assigned based on the class curve (i.e. relative grading). Your final class grade can be adjusted up or down depending on your level and quality of participation on your project team.

Classroom Protocol

It is expected that student attend classes, be active and participate in the class by asking/answering questions, arrive in time and leave only after the class is ended. No eating is allowed in the classroom, and it is expected to turn your cell off before entering the classroom.

University Policies

General Expectations, Rights and Responsibilities of the Student

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/>

CS 157A, Introduction to Database Management Systems, Section 6, Course Schedule

Any changes in the schedule will be sent to registered students through SJSU email 1 week earlier.

Tentative course calendar

Week	Date	Item
1	Aug 21 st	Lecture: Introduction and Data Model (Ch. 1 + Ch. 2)
1	Aug 23 rd	Lecture: Introduction and Data Model (Ch. 1 + Ch. 2)

2	Aug 28 th	Lecture: Relational Algebra (Ch. 2) + HW-1 Preview
2	Aug 30 th	Lecture: Relational Algebra (Ch. 2)
3	Sept 4 th	Lecture: Relational Database Design Overview (Ch. 3)
3	Sept 6 th	Lecture: Physical RDBMS Model: Schema design and normalization (Ch. 3)
4	Sept 11 th	Lecture: Physical RDBMS Model: Schema design and normalization (Ch. 3)
4	Sept 13 th	Lecture: Physical RDBMS Model: Schema design and normalization (Ch. 3) + Return HW1
5	Sept 18 th	Lecture: Logical RDBMS Model: E-R Model (Ch. 4) + HW-2 Preview
5	Sept 20 th	Lecture: Logical RDBMS Model: E-R Model (Ch. 4)
6	Sept 25 th	Lecture: Logical RDBMS Model: E-R Model (Ch. 4)
6	Sept 27 th	Lecture: SQL Overview and SELECT (Ch. 6)
7	Oct 2 nd	Lecture: SQL Overview and SELECT (Ch. 6)
7	Oct 4 th	Lecture: SQL JOIN, Aggregate, Grouping, Having and DML (Ch. 6) + Midterm Preview
8	Oct 9 th	Lecture: SQL JOIN, Aggregate, Grouping, Having and DML (Ch. 6) + SQL Group-by, Sub-query, Security (Ch. 7) + Return HW2
8	Oct 11 th	Midterm (Closed book)
9	Oct 16 th	Lecture: SQL Group-by, Sub-query, Security (Ch. 7)
9	Oct 18 th	Lecture: Transactions in SQL (Ch. 6.6), Constraints and Triggers (Ch. 7), Views and Indexes (Ch. 8)
10	Oct 23 rd	Lecture: Transactions in SQL (Ch. 6.6), Constraints and Triggers (Ch. 7), Views and Indexes (Ch. 8) + HW-3 Preview
10	Oct 25 th	Lecture: Transactions in SQL (Ch. 6.6), Constraints and Triggers (Ch. 7), Views and Indexes (Ch. 8)
11	Oct 30 th	Lecture: JDBC
11	Nov 1 st	Lecture: JDBC + Project Preview
12	Nov 6 th	Lecture: JDBC + SQL Persistent Stored Module (PSM) – Stored Procedure (Ch. 9) + Return HW3
12	Nov 8 th	Lecture: SQL Persistent Stored Module (PSM) – Stored Procedure (Ch. 9)
13	Nov 13 th	Lecture: SQL Persistent Stored Module (PSM) – Stored Procedure (Ch. 9)
13	Nov 15 th	Lecture: Embedded SQL, Dynamic SQL and CLI (Ch. 9)
14	Nov 20 th	Lecture: OLTP vs. Data Warehouse
14	Nov 22 nd	Thanksgiving Holiday
15	Nov 27 th	Lecture: Scalability Models + Big Data Issues
15	Nov 29 th	Lecture: MapReduce and SQL
16	Dec 4 th	Lecture: SQL vs. NoSQL + Return Project Report + Final Preview
16	Dec 6 th	Class Review + Project demo
17	Dec. 11 th	No Class (School is off)
17	Dec 13 th	Final (Closed book) – DH-135, Time is in this period: 3:00pm – 4:30pm