

San José State University
Department of Computer Science
Spring Semester 2017
CS 157B – Database Management Systems II, Section 5

Course and Contact Information

Instructor:	Ahmed Ezzat
Office Location:	Dunkin Hall, Room 282
Email:	Ahmed.Ezzat@sjsu.edu
Office Hours:	Tu 6:15PM – 7:17PM (by reservation)
Class Hours:	Monday, Wednesday: 7:30PM – 8:45PM
Classroom:	MH-222
Prerequisites:	CS 157A (Introduction to Database Management Systems) 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: TBD	Email: TBD

Course Description

Database management Systems II: Survey course. Object-oriented data model, definition language, query language. Object relational database systems. Database trends. Web database topics, namely, architectures, introduction to interface languages. Team projects. Prerequisite: CS 157A (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:

- Refresh: Relational Algebra
- Learn Secondary Storage Management in Relational Database Systems
- Learn Relational Indexes: B-tree, Hash Tree, Multi-dimensional indexes, and Bit-map indexes
- Learn Query Processing & Optimization & IBM Optimizer (Case Study)
- Learn Dynamic Query Optimization (Case Study)
- Learn Concurrency Control in the context of RDBMS
- Learn Triggers (E-C-A)
- Learn Transaction Management , Constraints, and Views
- Learn Database Failure and Recovery
- Learn Parallel and Distributed Database
- Survey to Advanced Topics: In-Memory DB, Object and Object-Relational DBs, and XML Database

- Learn Data Warehouse vs. OLTP, and OLAP

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.

Homework and Project descriptions are available on Canvas:

Homework:

- Homework-1: [Assignment is on Feb. 8, 2017, and is due back on Feb. 20, 2017.](#)
- Homework-2: [Assignment is on March 1, 2017, and is due back on March 13, 2017.](#)
- Homework-3: [Assignment is on March 20, 2017, and is due back on April 3, 2017.](#)
- Homework-4: [Assignment is on April 5, 2017, and is due back on April 17, 2017.](#)
- Homework-5: [Assignment is on April 24, 2017, and is due back on May 3, 2017.](#)

Projects:

- Project-1 (individual): [Assignment is on Feb. 1, 2017, and project is due back on Feb 13, 2017.](#)
- Project-2 (Group): [Assignment is on Feb. 15, 2017, Proposal is due on Feb, 23, 2017 and Final is due back on May 1, 2017.](#)
- Project-3 (Group): [Assignment is on April 19, 2017, and Final is due on May 10, 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) ([http://www.sjsu.edu/senate/docs/S06-4.pdf](http://www.sjsu.edu/senate/docs/S06-4)) 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:

- Homework (5) 20% 20 points individual scores
- Projects (3) 25% 25 points (5 pts P1 individual Project +
10 pts P2 Group project +
10 pts P3 Group project)
- Class Quizzes 10% 10 points individual scores
- Midterm 20% 20 points individual scores
- Final exam 25% 25 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.

Important NOTE:

In some occasions, the instructor may decide to administer evaluations where students are allowed to use their “paper notes”- (NO BOOK OR ELECTRONIC COPIES), so it is in your best interest to attend to class and take good notes; they may be handy in such situations. These individual in-class quizzes are not scheduled in-advance and they account to 10% of the overall class grade.

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 157B, Database Management Systems - II, Section 5, 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
2	Jan. 30 th	Lecture: Course Overview + Overview of Relational Algebra
2	Feb. 1 st	Lecture: Disk and Files, Records and Blocks organization, Storage (Ch. 13) + Project-1 Preview
3	Feb. 6 th	Lecture: Relational Indexes: B-tree, Hash table, Multi-dimensional indexes using hash and tree structures, Bitmap indexes (Ch 14)
3	Feb. 8 th	Lecture: Relational Indexes: (Contd.) + HW-1 Preview
4	Feb. 13 th	Lecture: Query Processing + Project-1 due
4	Feb. 15 th	Lecture: Query Optimization (Ch. 15 + Ch. 16) + Project-2 Preview
5	Feb. 20 th	Lecture: Query Optimization (Contd.) + HW-1 due
5	Feb. 22 nd	Lecture: Query Optimization (Contd.) + Case Study: IBM Query Optimizer (Home Reading)
6	Feb. 27 th	Lecture: Dynamic Query Optimization + Project-2 Proposal due
6	March 1 st	Lecture: Concurrency Control (Ch. 18) + HW-2 Preview
7	March 6 th	Lecture: Concurrency Control (Ch. 18) - Contd.
7	March 8 th	Lecture: Concurrency Control: Contd.
8	March 13 th	Lecture: Triggers (E-C-A) + HW-2 due
8	March 15 th	Lecture: Transaction Management (Ch. 19), Constraints (Ch. 7), and Views (Ch. 8) + Midterm Preview
9	March 20 th	Lecture: Transaction Management (Ch. 19), Constraints (Ch. 7), and Views (Ch. 8) – Contd. + HW-3 Preview
9	March 22nd	Midterm (Closed book)
10	March 27th	Spring Recess

10	March 29th	Spring Recess
11	April 3 rd	Lecture: Transaction Management (Ch. 19), Constraints (Ch. 7), and Views (Ch. 8): Contd. + HW-3 due
11	April 5 th	Lecture: System Failure & Recovery (Ch. 17) + HW-4 Preview
12	April 10 th	Lecture: System Failure & Recovery (Ch. 17) – Contd.
12	April 12 th	Lecture: Object and Object-Relational Databases
13	April 17 th	Lecture: Object and Object-Relational Databases (Contd.) + HW-4 due
13	April 19 th	Lecture: In-Memory Database (IMDB) + Column-oriented DB + Project-3 Preview
14	April 24 th	Lecture: In-Memory Database (IMDB) + Column-oriented DB (Contd.) + HW-5 Preview
14	April 26 th	Lecture: Parallel and Distributed Database (Ch. 20)
15	May 1 st	Lecture: Parallel and Distributed Database (Ch. 20) – Contd. + Project-2 due
15	May 3 rd	Lecture: XML Database + HW-5 due
16	May 8 th	Lecture: XML Database (Contd.)
16	May 10 th	Lecture: Data Warehouse and OLAP + Project-3 due
17	May 15 th	Lecture: Data Warehouse and OLAP (Contd.) + Final Preview
18	May 22nd	Final (Closed book) – MH-222, Time: 7:45pm – 9:15pm