

CE384: Database Design

Department of Computer Engineering
Sharif University of Technology
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Instructor

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Objective

To acquaint the undergraduate students with the fundamental concepts of database design and its application in computer science and engineering.

Course Description

This course focuses on database fundamentals, covering relational database theory, data modeling, and design principles. Essential for various applications like software development, business analytics, and web development, the skills acquired will prove valuable in managing and manipulating data efficiently. Topics include SQL, normalization, indexing, and transaction management, providing a foundation for real-world data challenges in contemporary technology fields.

References

Our main reference which we recommend you to read is [3, 1]. We are extremely grateful to the authors of [2, 4, 5] for the benefit we got from them in compiling the program of this lesson.

- [1] S. Sudarshan Abraham Silberschatz Henry Korth. *Database System Concepts*. McGraw Hill, 2010.
- [2] C. J. Date. *Introduction to Database Systems*. Pearson, 2003.
- [3] Navathe Shamkant Elmasri Ramez. *Fundamentals of Database Systems*. Financial Times Prentice Hall, 2015.
- [4] Andrew J. Oppel James R. Groff Paul N. Weinberg. *SQL: The Complete Reference*. McGraw Hill, 2009.
- [5] Johannes Gehrke Raghu Ramakrishnan. *Database Management Systems*. McGraw-Hill, 2002.

Classes

The classes will be held in person on Sunday and Tuesday from 4:30 PM to 6:00 PM in class 102. In special circumstances, virtual classes will be held on <https://vc.sharif.edu/ch/maryam.ramezani>. The schedule of the classes is available in the appendix. If a class is canceled by students, that class may be considered as completed in the continuation of the curriculum.

Workshops & TA Classes

TA classes will be held on the following topics, the date & times will be further noticed. The schedule of TA classes is available in the appendix.

- Exams Exclusive classes: For each of the midterm and final exams, a TA class will be held so that students can prepare adequately for the exam.
- SQL & NoSQL workshops: For those students who are not familiar with SQL or NoSQL and their related libraries, approximately four workshop classes will be held to cover SQL, NoSQL, and related libraries like Peewee.

Teaching Assistants

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Exams

Students' learning will be assessed by a midterm and a final exam. These exams will be held on the following dates and students are required to participate in them. Note that the final exam is comprehensive.

- **Midterm:** 1403/02/20 15:30 PM (From the topics of sessions 1 to 19)
- **Final Exam:** 1403/04/03 15:30 PM (Comprehensive)

Homework Assignments

Four series of homework assignments will be released in this course. Students should submit their answers in the Quera. Regarding *the late submission policy*, students are allowed to submit answers with 2 days of delay. 5 days of delay will be ignored in the way to minimize your loss. After that, 0.5% of the assignment grade will be subtracted for each hour of delay. Delays will be calculated on a scale of hours. It's obvious that *submission after the release of the solution of that assignment is forbidden*.

Grading

Please note that grades will be calculated out of 21.

- **Homework Assignments:** 7 points
- **Midterm:** 6 points, 1403/02/20 15:30 PM
- **Final Exam:** 8 points, 1403/04/03 15:30 PM

Statement on Collaboration, Academic Honesty, and Plagiarism

We encourage working together whenever possible on homework, working on problems in tutorials, and discussing and interpreting reading assignments. Talking about the course material is a great way to learn. Regarding homework, the following is a fruitful (and acceptable) form of collaboration; discuss with your classmates possible approaches to solving the problems, and then have each one fill in the details and write her/his own solution *independently*. At the top of each homework you turn in, we expect you to briefly list all sources of information you used, except known course materials like textbooks, Lectures, etc. A brief note such as “Did homework with ABC and ACB in study group” or “Looked at old solution for Problem 4” would be sufficient. Besides the morality issues, it will help TAs in grading your handouts. There will be a zero tolerance policy for Cheating/Copying HWs. The first time you are caught, you will receive a -100% of grade for the task at hand. If you are caught for a second time, you will fail the course. Refer to the Education Committee’s statement on homework etiquette.

Feedback

We would be grateful if you could send us your valuable feedback. You can contact the instructor or even TAs via email. You can also use this google form (<https://forms.gle/x9AK55xqqjmCdTJP8>) to send your feedback anonymously to the instructor.

Course Pages

- Jabrekh, <https://SharifDB.github.io/>: This is the main page of our course. All exercises, slides, and course resources will be placed on it.
- Quera, <https://quera.org/course/16609/>, Password: DB#1403#Spring: Delivery of exercises and announcements will be done entirely through Quera. Make sure you enter an email on Quera that you check regularly. Your questions from the exercises will also be answered in Quera.

Class Schedule

Date	Title	Description	Home Work
1402/11/15	S01	Course Overview and Introduction	
1402/11/17	S02	Database Architecture	HW1
1402/11/22	National Holiday		
1402/11/24	S03	Entity Relationship	HW1
1402/11/25	Add/Drop		
1402/11/29	S04	Entity Relationship	HW1
1402/12/01	S05	Entity Relationship	HW1
1402/12/06	National Holiday		
1402/12/08	S06	Entity Relationship	HW1
1402/12/13	S07	Entity Relationship	HW1
1402/12/15	S08	Logical Design	HW1
1402/12/20	S09	Logical Design	HW1
1402/12/22	S10	Logical Design	HW1
1402/12/22	HW1 Release		
1402/12/27	S11	SQL	HW2
1403/01/14	S12	SQL	HW2
1403/01/14	HW1 Deadline		
1403/01/19	S13	SQL	HW2
1403/01/21	S14	Index	HW2
1403/01/22	HW2 Release		
1403/01/26	S15	Partition	HW2
1403/01/28	S16	View	HW2
1403/02/02	S17	View & Data Independency	HW2
1403/02/04	S18	Integrity & Keys	HW2
1403/02/09	S19	Assertion & Trigger	HW2
1403/02/11	S20	Relational Algebra	HW3
1403/02/12	HW2 Deadline		
1403/02/16	S21	Relational Algebra	HW3
1403/02/18	S22	Relational Calculus	HW3
1403/02/20	Midterm	Topics in HW1 & HW2	
1403/02/21	HW3 Release		
1403/02/23	S23	Normalization	HW3
1403/02/25	S24	Normalization	HW3
1403/02/29	Withdraw Start		
1403/02/30	S25	Data Base Optimization	HW4
1403/03/01	S26	Advanced Topics	HW4
1403/03/04	HW3 Deadline		
1403/03/06	S27	NoSQL	HW4
1403/03/06	Evaluations start		
1403/03/06	Withdraw Deadline		
1403/03/08	S28	NoSQL	HW4
1403/03/10	HW4 Release		
1403/04/03	Final Exam		
1403/04/06	HW4 Deadline		
1403/04/14	Grade Submission		

Important: Note that this schedule is tentative and may be affected by unforeseen circumstances.

Workshops & TA Classes Schedule

Date	Title
To be determined	SQL Workshop
1403/02/19	Midterm
To be determined	NoSQL Workshop
1403/04/02	Final

Important: Note that this schedule is tentative and may be affected by unforeseen circumstances.

Homework Assignments Schedule

Assignment	Release	Submission	Solution Release	
1	1402/12/22	1403/01/14	1403/01/17	3 Weeks
2	1403/01/22	1403/02/12	1403/02/15	3 Weeks
3	1403/02/21	1403/03/04	1403/03/07	2 Weeks
4	1403/03/10	1403/04/06	1403/04/06	4 Weeks

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