

# Introduction to Databases (Spring 2021)

## Department of Software, Sungkyunkwan University (SKKU)

### Course Information

Course Title: Introduction to Databases

Instructor: Prof. Jongwuk Lee

Level: This is a **required course** for the **third-year** students.

Prerequisite: data structures and algorithms

### Contact information

Email: [jongwuklee@skku.edu](mailto:jongwuklee@skku.edu) Homepage: <http://jongwuklee.weebly.com>

Lab: Data Intelligence and Learning (DIAL) lab

Lab homepage: <https://diallab.github.io/>

Phone: 031-299-4329

Office: 85464 Corporate Collaboration Center

Office hours: 13:30 ~ 15:00 every Monday. For other time slots, please make an appointment.

### Course Objectives

The purpose of this course is to study the design and implementation of a database management system (DBMS). In this course, we will address DBMS for two perspectives: (1) *how to use DBMS* and (2) *how DBMS works internally*. The half of the course will focus on the use of database management systems: why we learn database, the relational data model, structured query language (SQL), and the entity-relationship (ER) model. The rest half of the course will cover the internals of relational database management systems such as file/table organizations, indexing structures, external sorting techniques, basic concepts of query optimization, and transactional features. Furthermore, we will address (3) *recent advances in big data processing and analysis*, i.e., NoSQL, Hadoop, and data mining.

**Feedback and comments:** In this course, my main goal is to provide students with stimulating and enjoyable experiences. If you have any opinions and feedback on class, feel free to contact me anytime.

### Textbooks and Readings

- *Fundamentals of Database Systems (7/E)*, Ramez Elmasri, Shamkant B. Navathe (Pearson, 2015)
- *Database System Concepts (7/E)*, Avi Silberschatz, Henry F. Korth, S. Sudarshan (McGrwa-Hill, 2019)
- *Database Management Systems (3/E)*, Raghu Ramakrishnan, Johannes Gehrke (McGrwa-Hill, 2002)
- *Database Systems: The Complete Book (2/E)*, Hector Garcia-Molina, Jeffrey Ullman, Jennifer Widom (Prentice Hall, 2009)

## Grading Assessment

**Attendance (10%):** Attendance is mandatory for every class. Because this course is a lecture-based class, it is particularly important to attend class time.

- **If you are absent, 0.5% is deducted. If you are late (after checking attendance), 0.25% is deducted.**
- **If you are absent more than seven times, your grading will be F unconditionally.**
- This course follows the university-level guidelines for exceptional cases.

**Exam (55%):** There are two exams (midterm and final exam), in a paper-written format. **If you are absent from the exams, your grading is F unconditionally.**

**Homework and Project (30%):** There are six assignments including programming. **If it is found that you have copied assignments, your grading will be F unconditionally.**

**Quiz (5%):** There is one in-class quiz for SQL. I will inform the date before the quiz.

## Summary of Assessment

Attendance	10%
Midterm exam	25%
Final exam	30%
Homework and Project	30%
Quiz & Participation	5%

## Important Policies

**Reading books:** I strongly recommend that you read related chapters in the textbook before class.

**Cheating:** Cheating is a severe problem and encompasses such behaviors as copying other people's work (including online plagiarism), bringing materials into an exam that are not allowed. If you let your work to reproduce, it will be considered as cheating behaviors as well. **If it is found that you have copied your homework or exams, your grading will be F unconditionally.**

**Late submission:** Each written assignment is due at 23:59:59 on the day. Students can submit the assignments in late, but **25% of the grade for that assignment will be deducted for every 24 hours.** For example, if the assignment is due on Thursday, 25% of the points will be taken off if it is turned in between class on Thursday and Friday. Likewise, 50% of the points will be deducted if it is turned in between Friday and Saturday.

**Grade evaluation:** Students would confirm your assessment scores at any time, but **it is not allowed to complain about final grading.** Please make sure to check your scores for attendance, homework assignments, participation, quiz, and exams.

## Course Schedule (Note: This schedule can be changed.)

Week	Date	Topic	Activity
1	Feb 22, Feb 24	Class Orientation Introduction to Database Systems	
2	Mar 1, Mar 3	Relational Data Model SQL Basics	
3	Mar 8, Mar 10	SQL Basics Intermediate SQL	HW #1 (Mar 8)
4	Mar 15, Mar 17	Database Design using the ER Model	Quiz #1 (Mar 15)
5	Mar 22, Mar 24	Relational Database Design	HW #2 (Mar 22)
6	Mar 29, Mar 31	Functional Dependency and Normalization	HW #3 (Mar 29)
7	Apr 5, Apr 7	Data warehousing and OLAP	
8	Apr 12, Apr 14	<b>Midterm exam (Apr 12)</b>	Project (Apr 14)
9	Apr 19, Apr 21	Data Storage Structures, Indexing Structures	
10	Apr 26, Apr 28	Transaction Management	HW #4 (Apr 26)
11	May 3, May 5	Concurrency Control	
12	May 10, May 12	Big Data Basics and Processing	HW #5 (May 10)
13	May 17, May 19	NOSQL Databases	Project presentation (May 17)
14	May 24, May 26	Data Mining Basics	
15	May 31, Jun 2	<b>Final exam (May 31)</b>	