

# Welcome to TDDD12 Database Technology



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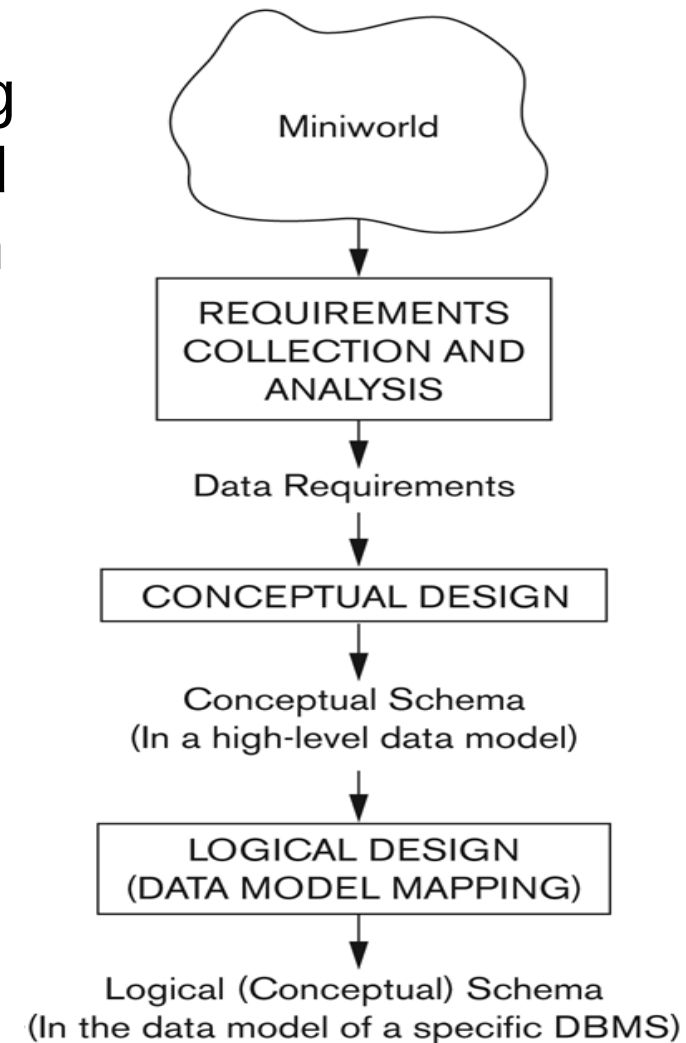
# Topics and Intended Learning Outcomes

# Course Topics

1. Fundamental concepts
2. Relational databases
3. SQL
4. EER modeling
5. Mapping of EER diagrams to relations
6. Functional dependencies and normalization
7. Stored procedures and triggers
8. Data structures for DBs
9. Introduction to Transaction Processing
10. Concurrency Control
11. Database Recovery
12. Query Processing

# After the course you should be able to ...

- *Design relational databases* for different types of example domains by first creating a conceptual schema using the Enhanced Entity-Relationship (EER) model and then translating this conceptual schema into a corresponding logical schema captured in the relational data model.
- Analyze and improve the quality of given relational database schemas based on the formal measure of *normal forms*.



# After the course you should be able to ...

- *Employ the SQL language* to query and to modify several example relational databases, as well as to create such a database with a given relational database schema.
- Compare the cost of finding and updating records in database storage files when using different approaches to organize and to index such files.
- *Apply basic techniques* that DBMSs can use to identify and to avoid problems that may occur when multiple users access a database concurrently.
- *Apply recovery algorithms* that DBMSs use to guarantee persistence of data even in the case of system failures.

# Examination

# Final Exam

- During the exam period after the course
- Dates: see pointer on the course Website



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# Four Assignments

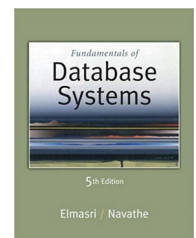
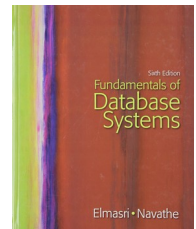
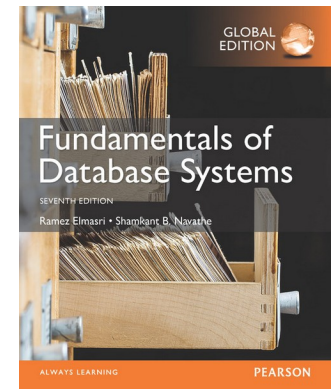
1. Database design and EER modeling
  2. SQL
  3. Functional dependencies and normalization
  4. BrianAir project, *4a*: initial design, *4b*: improved design  
*4c*: implementation, *4d*: urkund analysis
- Deadlines on the course Website
    - *hard deadlines* for assignments 4a and 4b (4a before assignment 2!)
  - To be solved in pairs
    - register with lab partners in Webreg before April 4
  - Use MySQL server for assignments 1 and 4c
    - need access to MySQL server provided by LiU IT
    - instructions on the course Website



# Organization of the Course

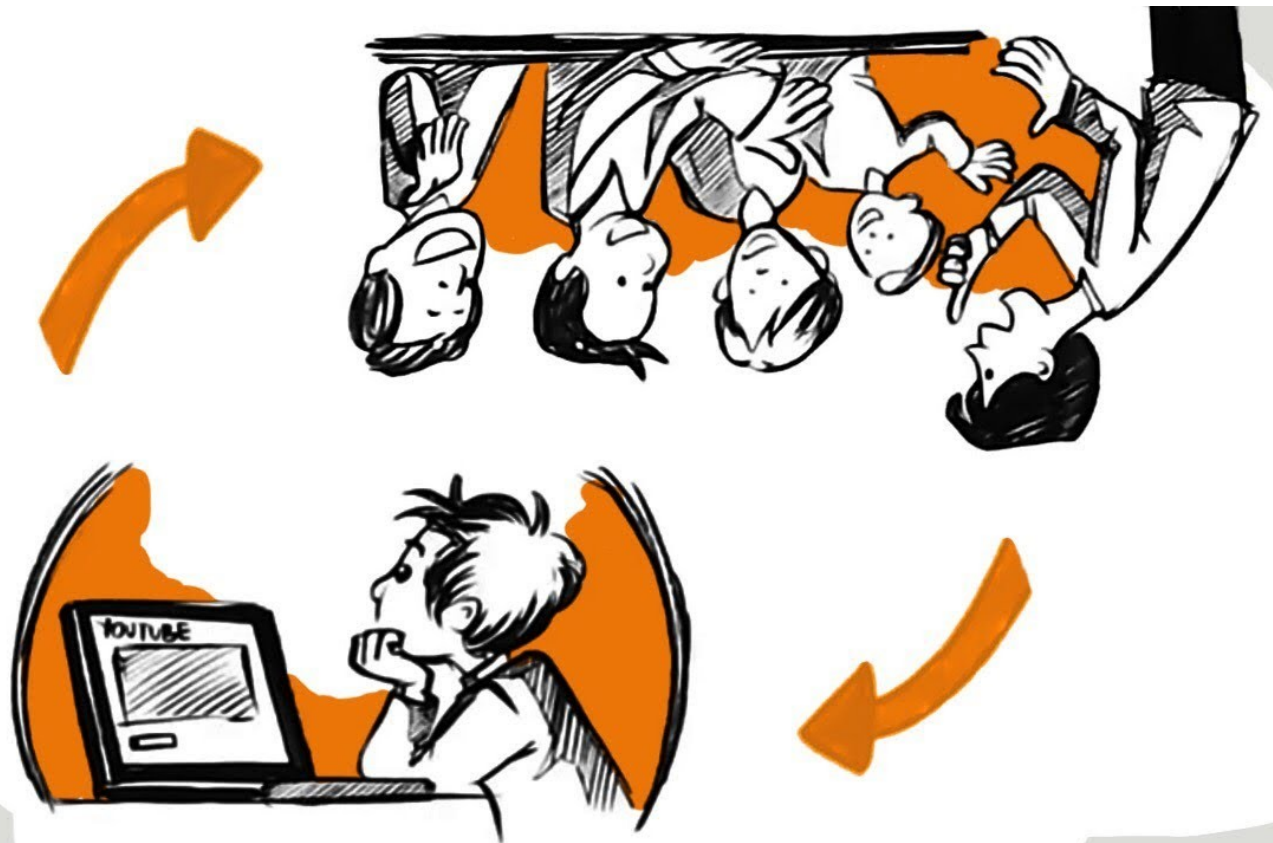
# Structure of the Course

- Schedule on the course Website
- 12 lecture sessions
  - Flipped-classroom style
- 9 lab sessions
  - First three: focus on assignment #2 (SQL)
  - Remaining six: focus on assignment #4c  
(not all of these six lab sessions will be supervised)
- 1 teaching session
  - Discussion of #4a hand-ins (mandatory!)
- Text book: Elmasri and Navathe. *Fundamentals of Database Systems*, Addison Wesley, 7th edition



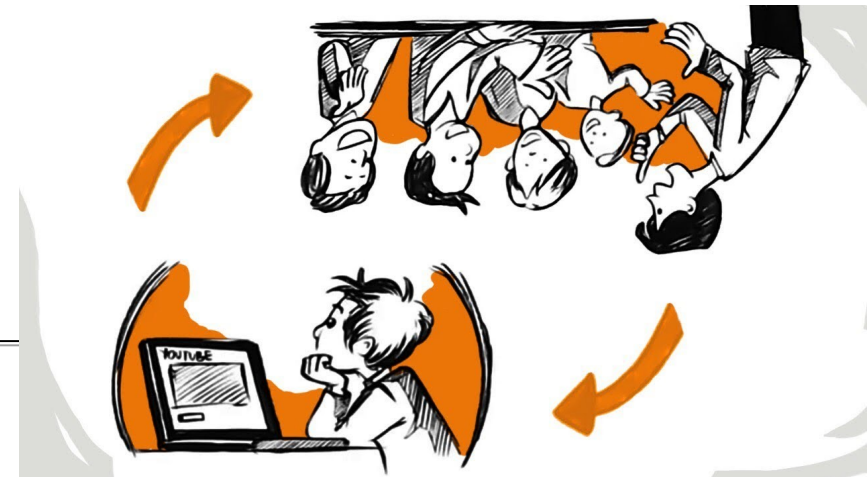
# Flipped Classroom-like Model

- Idea:
  - you watch a video lecture *before* the lecture session
  - we use the lecture session to do some quizzes, go through some additional examples, and discuss questions and things that were unclear to you in these video lectures



# Flipped Classroom-like Model

- Idea:
  - you watch a video lecture *before* the lecture session
  - we use the lecture session to do some quizzes, go through some additional examples, and discuss questions and things that were unclear to you in these video lectures
- In contrast to trying to replicate traditional lectures
  - more flexibility in terms of when you watch the videos (plus, you can pause, repeat, fast-forward, etc.)
  - role of the lecture sessions: give you ample opportunity to ask questions and to reinforce your learning of the concepts



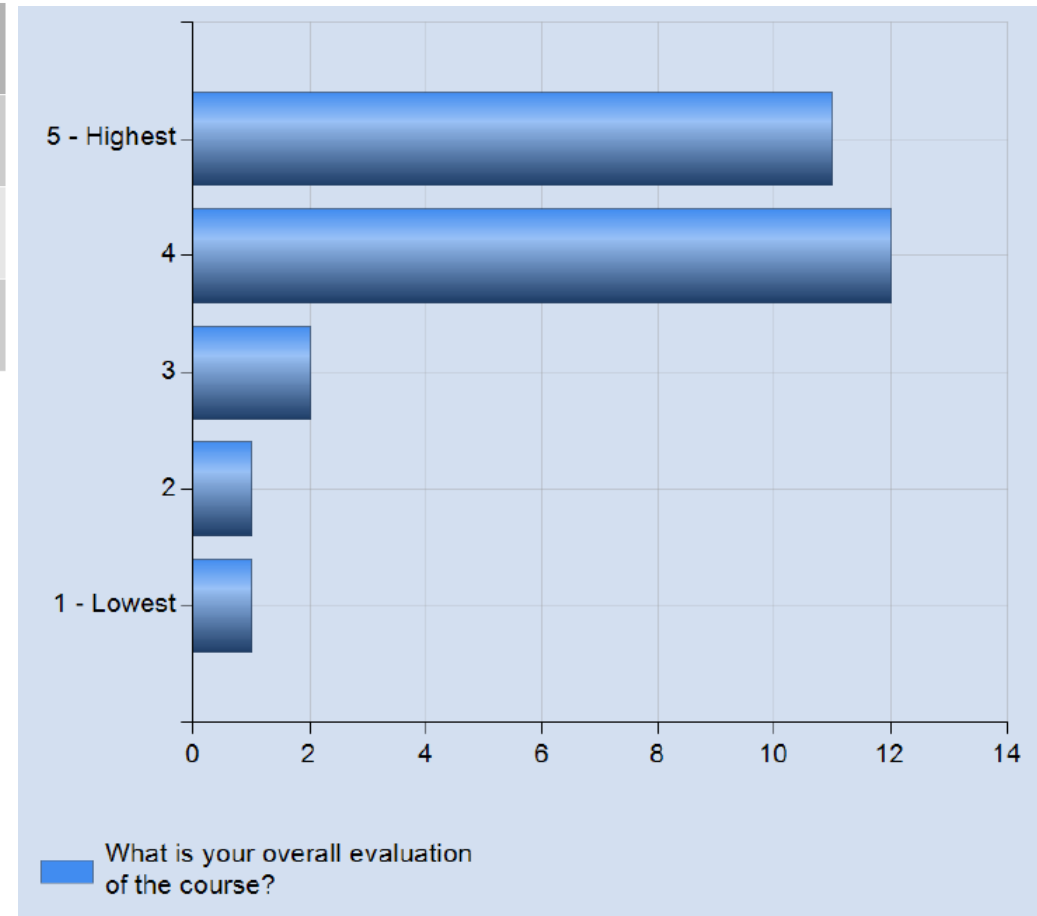
# Did you watch the video lecture?

- 1) Yes, all of it
- 2) Yes, partially
- 3) No, sorry
- 4) Video lecture??

# Earlier Versions of the Course

# EvalLiUate Evaluations 2021

	TDDD12
Overall number of students	116
Students who answered	27 (23.3%)
Overall evaluation	4.15 ( $\pm 0.99$ )



# Take-Aways from Free-Text Fields

- Many students like the flipped-classroom lectures, but not all
- Several complaints about having to watch videos in the evenings and, generally, about having to put in time for video watching

*“At first I didn't like the flipped classroom concept, since the lectures became roughly twice as long (about two hours of watching videos plus two hours for the "actual" lecture), but then I realized that studying for the exam became a lot easier thanks to all the flipped classroom quizzes and exercises.”*

- Kept the flipped-classroom lectures
  - Lecture sessions are an optional part of the course designed to reinforce your understanding of the relevant concepts
  - Video watching now part of the schedule in TimeEdit
  - Attention: no need to watch the videos in exactly these time slots
- Schedule reorganized
  - Topics in the beginning reordered (all DB design topics moved before SQL) to be able to stretch the time you have for working on the BrianAir project



# Take-Aways from Free-Text Fields (cont'd)

- Lab assignments very much appreciated, including particularly the BrianAir project
- Complaints about one of the lab assistants (seemed not knowledgeable about the subject)
- No changes to the assignments
  - But assignments 1 and 2 swapped (due to reordering of the lecture topics)
  - Work on BrianAir project starts earlier (assignment 4a is due before 2)
  - Beware and plan ahead:

*“There were sometimes very little time between the lecture of a topic and the deadline for the corresponding assignment. Since the assignments were of a reasonable degree of difficulty (i.e. not too difficult and not too simple), they could often be completed on time anyway. However, [...] it wouldn't hurt with a little more margin between lectures and deadlines.”*
- For each assignment, parts of it can be worked on already after earlier lectures
- Please let me know if you have issues!

[www.liu.se](http://www.liu.se)