1DV503 – 1DT903 Database Course Introduction

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Two Courses

- 1DV503 – Database technology
- 1DT903 – Databases and data modeling

What is a difference?

Students in 1DV503 course will have **written examination**, and students in 1DT903 course will have **oral examination (online for distance students)**

Outline

- Course content and structure
- Expected learning outcomes
- Teching Approach
- Books & Schedule
- About the teachers
- Examination and Grading

Course Content

- Introduction to Database System Concepts and Architectures (Chapter 1,2)

- Conceptual, relational, and physical data models (ER, EER, Relational data models) (Chapter 2 and 3)

- Database language: Structured Query Language (SQL) (Chapter 6)

- Database queries and database manipulation with SQL (Chapter 7)

- Functional dependencies and nomral forms (1NF,2NF,3NF,BCNF) (Chapter 14)

- Relational Algebra (Chapter 8)

- Application programming with SQL

- Transaction Processing Concepts and Concurrency Control Techniques (Chapter 20 and 21)

- Distributed Databases, NoSQL, Big Data Technologies (Chapter 23 and 24)

- Database Security (Chapter 30)

Course Structure

Lectures	Topics covered	Labs	Assignments
3 lectures (2,3,4)	•Introduction to Database System Concepts and Architectures •Conceptual, relational, and physical data models (ER, EER, Relational data models)	3 labs (1,2,3)	Assignment 1 Design ER and EER diagrams
3 lectures (5,6,7)	•Database language: Structured Query Language (SQL) •Database queries and database manipulation with SQL •Functional dependencies and nomral forms (1NF,2NF,3NF,BCNF) •Relational Algebra	3 labs (4,5,6)	Assignment 2 The Relational Data Model and SQL
1 lecture (8)	Application programming with SQL	3 labs (7,8,9)	Assignment 3 Database programming using Python and MySQL
3 lectures (9,10,11)	•Transaction Processing Concepts and Concurrency Control Techniques •Distributed Databases, NoSQL, Big Data Technologies •Database Security	NO	NO
Examination	•Written examination (includes all topics and lectures content) for 1DV503 •Oral examination (includes all topics and lectures content) for 1DT903 •Oral onlone examination (includes all topics and lectures content) for Distance Students		

In total: 10 lectures, 9 labs (**not mandatory**), 3 assignments, 1 exam (mandatory,writte/oral)

Expected Learning Outcomes

In the end of the course you should be able to:

- give an overview of different database concepts
- give an overview of different database types, e.g. relational, document and graph-based, non-sql database
- explain the different types of models (conceptual, logical and physical) which is used to produce and reason about a database, as well as
- explain the relational model, relational algebra, the connection to predicate logic and normal forms.
- design data models at different semantic levels (conceptual, logical, physical) using appropriate formalism such as Entity-Relationship and the relational model,
- optimize a database design by using normal forms (1NF, 2NF, 3NF, BCNF), taking into account the properties of the physical media that used for data storage, as well
- implement relational data models in a database manager as well as create, query and manipulate data using SQL via client programs and applications implemented in a programming language in a safe and reliable way.

Teaching Approach

- Theory on Lectures (on English)
- Practical exercises on labs (Swedish/English)
- Feedback as additional teaching method (Swedish/English)
- Answers on questions in moodle forums or Slack (Swedish/English)
- Written Exam (on English, Swedish on request)
- Oral Exam (English/Swedish)

All lectures and labs will be streamed in Zoom (lectures recorded)
https://mymoodle.lnu.se/mod/url/view.php?id=3639966

Slack channel to ask questions for assignments:
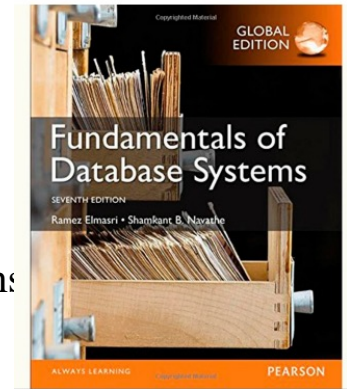
https://coursepress.slack.com/archives/C02UD1QA6RK

Books & Schedule

Books:

- Elmasri, Ramez, & Navathe, Shamkant B., Fundamentals of database systems edition

- Risch, Tore och Padron-McCarthy, Thomas, Databasteknik.

- Database Design ([Available oline as PDF](#)) (https://opentextbc.ca/dbdesign01/)
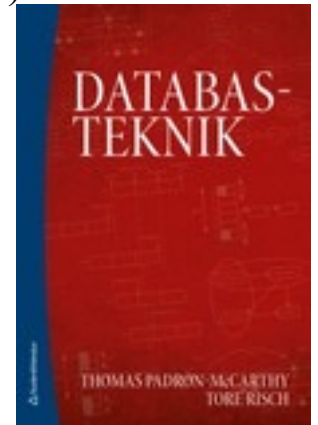
Lectures/Labs every:

- Wednesdays 13:00-15:00

- Fridays 10:00-12:00 and 15:00- 17:00 (labs)

3 times in Kalmar on **25/01 (Lecture), 10/02 (Lab), 24/02 (Lecture)**

Software used in this course:

- MySQL Server
- MySQL Workbench
- Visual Studio and Python 3

About Teachers

Course coordinator and lecturer is Alisa Lincke (alisa.lincke@lnu.se)

Teaching Assistances (TAs) are:

- Johannes Jansson (jj224an@student.lnu.se)
- Filip Ström (fs223gv@student.lnu.se)
- Khaled Matar (km222uq@student.lnu.se)
- Yan Song (ys222ei@student.lnu.se)
- Meichen Ji (mj224nu@student.lnu.se)
- Ryustem Shaban (rs223fx@student.lnu.se)

Examination 1DV503

Name	Credits	
Non-programming assignments	1,5	Assignment 1 and Assignment 2
Programming assignment	3	Assignment 3
Written exam	3	Written exam

Final Grade = (Assignment1 * 0.5 credit + Assignment2*1credit + Assignment3 * 3credit + exam * 3 credits)/7,5

Examination 1DT903

Name	Credits	
Non-programming assignments	1	Assignment 1 and Assignment 2
Programming assignment	2	Assignment 3
Oral exam	2	Oral exam

Final Grade = (Assignment1 * 0.5 credit + Assignment2*0.5 credit + Assignment3 * 2credit + Exam*2 credits)/5credits

Grading

Percentage	ECTS Grade	LNU Grade
0% - 59%	F (Fail)	U (underkänd)
60% - 67%	E	G
68% - 76%	D	G
77% - 85%	C	G
86% - 94%	B	VG
95% - 100%	A	VG

Questions?