

# TDBD15 – Advanced Data Models and Systems

March 20, 2002

## 1 Course Staff

Instructor	Michael Minock
Email	mjm@cs.umu.se
Office	C445 MIT-huset
Office Hours	Tuesday, Thursday, and Friday 15:00 – 17:00 (or when my door is open and I have time)

## 2 Course Language

All lectures will be given in English, and all written work must be submitted in English. For the final examination, it will be permitted to use an XX-English / English-XX dictionary, where XX is the language of the student's choice.

## 3 Course Readings

The text for the class is the text used in the regular database course[3]. Additional readings will be made available through the website. In addition you may wish to purchase one of the PostgreSQL books on the market.

## 4 Online Resources

<http://www.cs.umu.se/kurser/TDBD15/VT02/>

## 5 Course Topics

The readings are listed next to the following outline of course content.

1. Introduction ([1])
2. Semantic Modeling
  - 2.1 EER and Semantic Modeling (chapter 4(excluding 4.6) and 9.2[3])
3. Object-Relational Approaches
  - 3.1 PostgreSQL ([5])
  - 3.2 SQL1999 and Object-Relational Systems (chapter 8 and 13[3])
4. Alternative Industrial Approaches
  - 4.1 Object Oriented Databases (ODMG)
  - 4.2 Semi-structured Data-models (XML)
5. Special Requirements
  - 5.1 Temporal Database Concepts (Section 23.2[3])
  - 5.2 Spatial Database Concepts (Section 23.3[3])
6. Deductive Databases
  - 6.1 Deductive Database Theory (Chapter 25[3])
  - 6.2 LDL++ ([7])
7. Description Logics
  - 7.1 Description Logics ([2])
  - 7.2 CLASSIC ([6])
8. Representing Incompleteness and Uncertainty
9. Data Mining (Section 26.2[3])
10. Conclusions and Exam Review

## 6 Course Schedule

Week	Date	Time	Room
13	Tue 26-Mar	8.15 - 12	MC413
15	Tue 09-Apr	8.15 - 12	MC413
15	Fri 12-Apr	10.15 - 12	MC413
16	Tue 16-Apr	10.15 - 12	MC413
16	Fri 19-Apr	10.15 - 12	MC413
17	Tue 23-Apr	10.15 - 12	MC413 - Project Proposals Due
17	Fri 26-Apr	10.15 - 12	MC413
18	Tue 30-Apr	10.15 - 12	MC413
18	Fri 03-May	8.15 - 12	MC413
19	Tue 07-May	10.15 - 12	MC413
20	Tue 14-May	10.15 - 12	MC413
20	Fri 17-May	10.15 - 12	MC413
21	Tue 21-May	10.15 - 12	MC413
21	Fri 24-May	8.15 - 12	MC413
22	Tue 28-May	10.15 - 12	MC413 – Review
22	Fri 31-May	10.00 - 13	MC413 – Exam 1
23	Thr 06-Jun	10.00 - 16.00	MC413 – Project Presentations
35	Fri 30-Aug	9.00 - 15.00	Skrivsal 6 – Exam 2

## 7 Grading System

40% (400 points) of the grade for the course will be based on a group project and 50% (500 points) will be based on an exam covering the reading materials and lectures. In addition, there will be 3 exercises with each accounting for 33 points covering 9.9%<sup>1</sup> of the grade.

In addition I will award bonus points for correctly answering difficult portions of the exercises or test. Bonus points may also be awarded to those who do an outstanding job on the project. Note that to actually be credited these points, the student must obtain at least 50% (250) points on their final exam.

In this class all homework is optional. Hence if you are **late** with it, you will lose points. Once the points for the homework have been exhausted, there is no way for you to receive points on the homework (unless you repeat the course). This is also the case with the final project.

<sup>1</sup>As an opening act of generosity, the final 1 point (0.1%) will be awarded for simply enrolling in this class.

Total points ( $p$ )	Grade
$p \geq 800$	5
$800 > p \geq 650$	4
$650 > p \geq 500$	3
$p < 500$	U

If you do not amass 500 points after this second exam, then you must repeat the course to receive a passing grade.

## 8 Exercises

There will be three system exercises assigned during the course. Students may work in groups of up to four persons on these exercises. Each exercise shall be worth 33 points, but exercises will lose 10 points per day late.

## 9 Project

Working in groups of up to four persons, students must propose, in writing (max 350 words) and in person, a project of joint interest. And this proposal *must* in turn be accepted. Candidate projects will occasionally be announced and described in class, but I would prefer for students to engage their creativity and propose programming (or theoretical) projects of their own interest. Note that students who do not have an accepted project by April 23rd, will lose 50 points and will have a project assigned by me (to be received by the student(s) prior to the lecture on April 26th).

The students must complete the project by the end of the course. In a special day-long demo session they must present their work in a 20 minute talk. If the work is a system or application, they must also give an "industrial style" demo of their working system. In all cases the students must write a report, including a carefully crafted 1-page executive summary. Note that all group members must be present at the demonstration and should be able to enthusiastically describe and support their group's system or application. Projects lose 50 points per day late.

The grades for the group projects will be assigned to all members equally. The grade will be based on the quality of the proposal, system demonstration, presentation material (and delivery), and the final written report.

## References

- [1] P. Bernstein, M. Brodie, S. Ceri, D. DeWitt, M. Franklin, H. Garcia-Molina, J. Gray, J. Held, J. Hellerstein, H. Jagadish, M. Lesk, D. Maier, J. Naughton, H. Pirahesh, M. Stonebraker, and J. Ullman. The asilomar report on database research, 1998.
- [2] F. Donini, M. Lenzerini, D. Nardi, and A. Schaerf. Reasoning in description logics. In G. Brewka, editor, *Studies in Logic, Language and Information*, pages 193–238, 1996.
- [3] R. Elmasri and S. Navathe. *Fundamentals of Database Systems 3rd edition*. Addison Wesley, 2000.
- [4] T. Gaasterland, P. Godfrey, and J. Minker. An overview of cooperative answering. *Intelligent Information Systems*, 1(2):127–157, 1992.
- [5] Bruce Momjian. *PostgreSQL: Introduction and Concepts*. Addison Wesley, 2001.
- [6] L. Resnick, D. McGuinness, E. Weixelbaum, M. Abrahams, and A. Borgida. Neoclassic user’s guide: Version 1.0., 1997.
- [7] Carlo Zaniolo. *LDL++ Tutorial (For version 5.1)*. UCLA Computer Science Department, 1998.