TDBB08 Logic with Applications Spring 1998(b)

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1. Course Staff:

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2. Course Language:

Lectures will be given in English. Obligatory exercises may be submitted in either English or Swedish. The final examination will be in English, and students will be expected to answer in English. Exceptions may be made upon special arrangement with the instructor.

3. Course Literature:

Main textbook: John J. Kelly, *The Essence of Logic,* Prentice-Hall, 1997; ISBN: 0-13-396375-6 (paper).

4. Course Content and Outline

Beginning with offerings in 1998, the official course description (kursplanen) has been modified. Under the old course description, three main areas were covered:

propositional logic, first-order logic, and logic programming in Prolog. Under the new course plan, the logic-programming component is dropped. This decision was reached because experience demonstrated there is not enough time in a single five-point course to cover all three topics adequately. The course will nonetheless continue with an eye towards those aspects of logic which are central to applications in computer science.

An outline of the course is shown below. The numbers shown in the rectangular brackets (*i.e.*, [..]) identify chapters and sections in the textbook. The numbers in angle brackets (*i.e.*, ⟨..⟩) indicate the approximate number of 45-minute lecture periods which will be devoted to the topic. Please note the following.

- Reasonably detailed overhead slides will be avaialable, on-line, for all topics. The authoritative source for relevant (*i.e.,* possible examination material) is the course lectures and these slides. In many cases, material not covered in the textbook may nonetheless be covered in lecture presentations.
- The number of 45-minute lecture "hours" to be devoted to each topic is approximate. Adjustments may be made as the course progresses.

1. Introduction [] ⟨2⟩
2. Propositional Logic
   - 2.1 Basic definitions [1] ⟨2⟩
   - 2.2 Semantic tableaux [2] ⟨2⟩
   - 2.3 The classical Hilbert proof system [4] ⟨2⟩
   - 2.4 The resolution proof system[5] ⟨4⟩
   - 2.5 Gentzen-style proof systems [3.3] ⟨4⟩
   - 2.6 Horn clauses [] ⟨4⟩
3. First-Order Logic
   - 3.1 Basic definitions [6.1-6.8] ⟨2⟩
   - 3.2 The resolution proof system
     - 3.2.1 Normalization of sentences [9.2] ⟨2⟩
     - 3.2.2 Substitution and unifiers [9.4-9.8] ⟨3⟩
     - 3.2.3 Answer extraction [] ⟨1⟩
     - 3.2.4 Equality [] ⟨3⟩
   - 3.3 Computational properties [9.3] ⟨2⟩

4. Review ⟨1⟩

5. Course Schedule

The table below identifies the course meeting times and places, together with the nature of the meeting. The key "L" denotes a lecture, while "D" denotes a discussion session.

For each lecture, the topics to be covered are identified via the outline header number of Section 4 of this syllabus. So, for example, on April 21 the topics of 2.6, Horn clauses, will be covered. This is only an approximate assignment of meeting times to topics, and it may be altered as the course progresses.

There will be only two discussion meetings on exercise days, and not three as identified in the original course schedule. The topics to be covered during the discussion meetings will be determined as the course progresses, but will generally include the topics of lectures during the previous week or two. The two discussion meetings on each given day will cover essentially the same material, and a student is expected to attend only one of them. Initially, anyone may attend either meeting, but there proves to be a problem of sufficient space in the rooms, some assignment of students to discussion meeting may have to be made.

Stephen Hegner will deliver the lectures, while Petter Edblom will run the discussion sessions.

Week	Type	Date	Time	Room	Topic
13	L	Mar. 24	0815-1000	MA236	1
	L		1015-1200	MA236	2.1
	L	Mar. 27	0815-1000	MA246	2.2
	D		1015-1200 / 1315-1500	MA206 / MA206	
14	L	Mar. 31	0815-1000	MA246	2.3
	L	Apr. 3	0815-1000	MA236	2.4
	L		1015-1200	MA236	2.4
15	L	Apr. 7	0815-1000	MA246	2.5
	D		1015-1200 / 1315-1500	MA206 / MA206	
16	L	Apr. 14	0815-1000	MA112	2.5
17	L	Apr. 21	0815-1000	MA246	2.6

18	L	Apr. 28	0815-1000	MA246	2.6
	D		1015-1200 / 1315-1500	MA206 / TC331	
19	L	May 5	0815-1000	MA246	3.1
	L	May 8	0815-1000	MA246	3.2.1
	D		1015-1200 / 1315-1500	MA378 / TC331	
20	L	May 12	0815-1000	MA246	3.2.2
	L	May 15	0815-1000	MA246	3.2.2, 3.2.3
	D		1015-1200 / 1315-1500	MA206 / TC331	
21	L	May 19	0815-1000	MA236	3.2.4
22	L	May 26	0815-1000	MA246	3.2.4, 3,3
	D		1015-1200 / 1315-1500	MA206 / TC331	
	L	May 29	0815-1000	MA246	3.3, 4
23	E	Jun. 3	0900-1500	GIMO	Final Examination

6. Computer Resources

There is no formal programming requirement for this course. However, students will be expected to be able to use a web browser and associated software in order to fetch course documents from the on-line database, noted below.

7. On-Line Resources

Whenever feasible, images of overhead transparencies and the like will be made available on-line, at the web page for the course, which is

http://www.cs.umu.se/local/kurser/TDBB08/V98b/index.html

8. Grading System

The final grade will be determined as follows.

Final Examination:	90%
Obligatory Work:	10%

9. Obligatory Work

The course includes five obligatory written and computer exercises for which the student must submit satisfactory solutions in order to be allowed to sit the final examination. The rules governing these submissions are as follows.

- To be allowed to sit the final examination, the student must complete all five exercises satisfactorily. Thus, in the first instance, each exercise will be marked as satisfactory or unsatisfactory.
- A grade between 0 and 10 inclusive will be assigned to each submission. This grade is, in principle, independent of the evaluation of satisfactory or unsatisfactory, although a high numerical grade will almost always indicate satisfactory work.
- Exercises marked as unsatisfactory may be resubmitted for another evaluation. However, the point total of a resubmission may never exceed the point total of the original submission. Work may not be resubmitted more than once without special permission.
- Each exercise will have a due date. For each working day that the submission is late, three points will be subtracted from the grade. (The grade may never be less than zero, of course.)
- Grading resources are limited. Therefore, work submitted well after the deadline may not be graded at all. If you must submit work late, discuss this with the course assistant.
- At the end of the course, the point totals on the obligatory work will be averaged, resulting in a number between 0 and 10 inclusive. This number will constitute 10% of the final examination points.