TDDB44/TDDD55 Organizational Issues

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Staff 2022

- Adrian Pop (AP)
  - Examiner (responsible for the courses and grading)
  - Lectures (second half)
- Jonas Wallgren (JW)
  - Adjunkt (more or less full time teaching)
  - Lectures (first half)
  - Labs and Lessons TDDB44
- John Tinnerholm
  - PhD student (20% teaching)
  - Labs and Lessons TDDD55
- See homepage (keeps changing)
  - Course secretary

Lecture Plan

- Fö1: Introduction (AP)
- Fö2 [optional for TDDB44]: Short introduction to formal languages ... (JW)
- Fö3 [optional for TDDB44]: ... and automata theory (JW)
- Fö4: Lexical analysis; Symbol tables (JW)
- Fö5: Parsing; Top-Down Parsing (JW)
- Fö6: Top-Down Parsing cont., Bottom-Up Parsing (intro) (JW)
- Fö7: Bottom-Up Parsing [LR(0) items optional for TDDD55] (JW)

Lecture Plan (cont.)

- Fö 8: Semantic analysis and internal forms. Syntax-driven translation. (MS)
- Fö 9: Memory management; run-time organization ... (AP)
- Fö10: Code optimization (AP)
- Fö11: Code generation; general (AP)
- Fö12 [optional for TDDD55]: Code generation for RISC and superscalar processors (AP)
- Fö13: Error management. Interpreters (AP)
- Fö14: Bootstrapping. Compiler Generators. (AP)

Lessons / Tutorials

4x2h for TDDB44 and TDDD55

- Exercises on background theory (TDDD55)
- Preparation for the laboratory assignments (especially useful when we get a schedule where lab 3 comes before lab 2 and the lecture that covers the material ☹)
- Exam preparation session

Laboratory Assignments

- Separate for TDDD55 (2hp) and TDDB44 (3hp)
- Teams of size 2; single students might not fit in the labs this year
- Register via webreg (linked from the course home pages)
  - Remember to **register** to this course or webreg can give you "funny" error messages.
  - It takes until the next working day for course registrations to be updated in webreg.

Rules for examination of computer labs at IDA

You are expected to do lab assignments in group or individually, as instructed for a course. However, examination is always based on individual performance.

It is not allowed to hand in solutions copied from other students, or from elsewhere, even if you make changes to the solutions. If there is suspicion of such, or any other form of cheating, teachers are obliged to report it to the University Disciplinary Board.

Be prepared to answer questions about details in specific code and its connection to theory. You may also be asked to explain why you have chosen a specific solution. This applies to all group members.

If you foresee problems meeting a deadline, contact your teacher. You can then get some help and maybe the deadline can be set to a later date. It is always better to discuss problems, instead of, e.g., to cheat.

Any kind of academic dishonesty, such as cheating, e.g. plagiarism or use of unauthorized assistance, and failure to comply with university examination rules, may result in the filing of a complaint to the University Disciplinary Board. The potential penalties include suspension, warning.

https://www.ida.liu.se/edu/ugrad/lab_exam/

Policy for handing in computer lab assignments at IDA

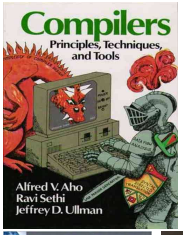
For all IDA courses having computer lab assignments there will be one deadline during or at the end of the course. If you fail to make the deadline, you must retake the, possibly new, lab course the next time the course is given.
If a course deviates from this policy, information will be given on the course web pages.
`https://www.ida.liu.se/edu/ugrad/lab_exam/`

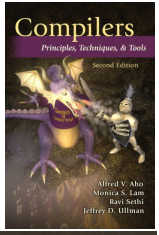
- 2022-12-21 for bonus points on the exam (TDDB44).
- Recommended last day to demonstrate and hand in final labs is the last scheduled lab. (Your teacher might be unavailable for example due to travelling for Christmas at later dates).
- If you have only 1 (TDDD55) or 2 (TDDB44) labs remaining, it will be possible to correct the labs until the end of the exam period. After that you will generally need to wait until the next time the course is given.
- Extensions are given only for good reasons (typically a note from your doctor).

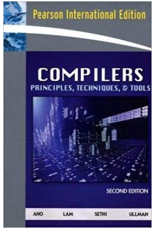
Literature

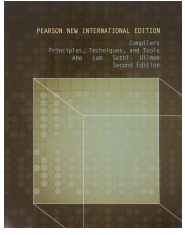
Mandatory (more or less):

- Aho, Lam, Sethi, Ullman: *Compilers – Principles, Techniques, and Tools*, Second Edition. Addison-Wesley, 2006.
  - 2007 version is a paperback that is the same (but published by Pearson International)
  - 2014 Pearson New International Edition is the same except the last chapter was magically removed. The book is larger, heavier, and more fragile than the older ones though.
  - The old first edition (1986) is still ok if you can find copies









Course homepage:

- Lab assignments
- Lecture notes
- Compiler construction exercises (exam preparation)

Exams

- Most assignments are the same for TDDB44 (3hp) and TDDD55 (2hp) except:
  - TDDD55: Formal languages / automata theory
  - TDDD55: Using an LR parser
  - TDDB44: RISC/CISC
- For TDDD55 students, the exam can be challenging without adequate preparation. There is an extra tutorial to prepare you for some of the harder exam assignments.
- For TDDB44, the lab series also prepares you for the exam since the labs are much more extensive than TDDD55. Our experience is that TDDB44 have an easier time preparing for the exam despite the assignments being more difficult.
- The TDDD55 exercises are split into 2 parts: fundamentals (which you must know) and advanced topics (which are used for higher grades), meaning you need to study fewer topics if you only want grade 3.
- The TDDB44 exercises give **3 bonus points** on the regular exam (not re-exams), if you pass the lab series before the deadline (end HT2 study period).

Course homepages

All information you need in the course are in your course home pages:

- `https://www.ida.liu.se/~TDDB44`
- `https://www.ida.liu.se/~TDDD55`

Note that Lisam will only be used for recorded lectures.
You still need to **register** to this course.

Course Evaluations

	TDDB44			TDDD55		
Year	Responses	Rating	Hours	Responses	Rating	Hours
2021-HT	27% (6 / 25)	3.84		25% (3 / 12)	3.0	
2020-HT	24% (6 / 25)	4.00		17% (3 / 18)	2.7	
2019-HT	0% (0 / 16)	-		14% (3 / 21)	4.00	
2018-HT	28% (11 / 39)	4.36		0% (0 / 15)	-	
2017-HT	28% (9 / 32)	3.89	34.4	8% (1 / 13)	2	60
2016-HT	24% (8 / 34)	3.75	34.3	27% (3 / 11)	4.33	53.3
2015-HT	32% (10 / 31)	4	43.3	28% (7 / 25)	3.33	41.7
2014-HT	24% (10 / 41)	4	36	8% (2 / 26)	3	25

Note: Before 2018, Kurt was used instead of Evaliuate.

Recent Course Changes

2022

- Back to campus for everything

2020, 2021

- Distance/Hybrid mode due to covid-19

2019

- Easier exam for TDDD55 (format was changed)
- TDDD55 instructions in HTML rather than PDFs, lab skeleton on gitlab
  - TDDB44 was changed last year to the same format, with good feedback

What comes after this course?

Join one of our compiler research teams at pelab and do a bachelor / master thesis project in compiler technology:

- Compiling for OO modeling languages (**OpenModelica**)
  - Compiler bootstrapping, international open source compiler, `www.openmodelica.org` (P. Fritzson, A. Pop, M. Sjölund)
  - Compilation on parallel machines (P. Fritzson, M. Gebremedhin)
  - Compiling for embedded systems (P. Fritzson, M. Sjölund)
  - We are also looking into the Julia programming language (J. Tinnerholm, A. Pop)
  - Debugger technology (P. Fritzson, M. Sjölund, A. Pop)
- Operational semantics based compiler generation (P. Fritzson, A. Pop)
- Code generation for instruction-level parallel and embedded processors (C. Kessler)
- Optimization problems in code generation (C. Kessler)
- Retargetability (C. Kessler)
- Program analysis and transformation, including automatic and semiautomatic parallelization (C. Kessler)
- ... and more

www.liu.se