Syllabus — 編譯程式設計(Spring, 2007)

1. Teacher:

2. 助教: Email:
   TA office hours:

3. Web page for this course: http://www.iis.sinica.edu.tw/~tshsu/compiler2007

4. Class materials:

   - Textbook: "*Compilers Principles, Techniques, and Tools*", by Aho, Lam, Sethi, and Ullman, 2007 (2nd edition) Addison Wesley. — The updated "dragon" book.
     Textbook homepage: http://dragonbook.stanford.edu

   - Class notes: Class notes for the year 2006 is available at
     http://www.iis.sinica.edu.tw/~tshsu/compiler2006
     Note: This previous set of notes is based on the original "dragon" book (first edition). New set of class notes will be based on the 2nd edition.

5. 上課時間及地點: 每週四2:20PM – 5:10PM.

6. Class dates:

Mar	1	8	15	22	29
Apr		12	19	26 (mid-term exam)	
May	3	10	17	24	31
Jun	7	14	21		

7. Office hours: by appointments; before or after the classes.

8. Prerequisites: assembly language, high-level programming language (C-like language), data structures, and automata.

9. Topics: (Reading ch#1.6 and ch#2 by yourself is expected.)

   - Introduction (ch#1.1–1.5)
   - Lexical analysis (Scanner) (ch#3.1–3.4, 3.6, 3.7, 3.5, 3.8): regular expressions, finite state automata, LEX
   - Syntax analysis (Parser) (ch#4.1–4.7): context-free grammar, top-down parsing, LL(1), bottom-up parsing, SLR, LR(0), LR(1), LALR(1)
   - Syntax-directed translation (ch#5.1–5.6, 4.8, 4.9): Syntax-directed translation, using ambiguous grammar, YACC
   - Symbol tables (ch#2.7, 6.5): data structures for symbol tables, type checking
   - Intermediate code generation (ch#6.1–6.4,6.6–6.8): intermediate code, declarations, expressions, advanced data structure, control flow, procedure/function, other statements
   - Run time storage organization (ch#7.1–7.4): stack, access to no-local data, heap
   - Optimization (ch#8.4,8.5,8.6,9.1,9.2,8.7): basic blocks, flow graphs, machine-independent optimizations
   - How to write a compiler
   - Advanced topics[1]: garbage collection (ch#7.5–7.8), parallelism (ch#10, ch#11), ...

[1] if time allowed.

10. Lecturing schedule (approximately)

No.	Date	Topics	Notes
1	March 1	Introduction; Scanner (I)	
2	March 8	Scanner (II) LEX	 Announcing HWK#1
3	March 15	Parser: Introduction Top-down parsing (I)	
4	March 22	Top-down parsing (II)	HWK#1 due Announcing HWK#2
5	March 29	Bottom-up parsing (I)	
	April 5	**Holiday**	
6	April 12	Bottom-up parsing (II)	HWK#2 Due Announcing HWK#3
7	April 19	Bottom-up parsing (III)	
8	April 26	**Mid-term exam**	covering lectures 1–7 HWK#3 due
9	May 3	Syntax-directed translation	
10	May 10	YACC and data structures	Announcing HWK#4
11	May 17	Intermediate-code generation (I)	
12	May 24	Intermediate-code generation (II)	
13	May 31	Run-time environments (I)	HWK#4 due Announcing HWK#5
14	June 7	Run-time environments (II)	
15	June 14	Optimization	
16	June 21	Putting everything together	HWK#5 due
	TBA	**Final project due**	

11. Evaluation:

    (a) homework (25%): all due dates for homework are **FIRM**, one homework per 2 to 3 lectures.
    作業遲交每一天扣10%, 抄襲(被抄襲)均不計分. 期末專題不得遲交,抄襲(被抄襲)均不計分.

    (b) mid-term exam (35%): April 26, 2:20PM–5:10PM.

    (c) final project (40%): check points, documents, presentation, and testing;

    (d) class participation and performance.