

# 計算理論 Theory of Computation (705 30400)

Spring 2008

## Place and Time

Room 205 in Management Building II, Wednesday 14:20 – 17:20.

## Course Web Site

<http://www.iis.sinica.edu.tw/~trc/public/courses/Spring2008/>

## Instructor

莊庭瑞 (中央研究院 資訊科學研究所 副研究員)

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## Teaching Assistant

林瑞億 (Darren Lin)

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## Schedule (subject to adjustment)

**02/20** Preliminaries; A Programming Language. (1; 2.1–2.2)

**02/27** Computable Functions; Primitive Recursive Functions. (2.3–2.5; 3.1–3.4)

**03/05** Coding Programs by Numbers. (3.5–3.8; 4.1)

**03/12** The Halting Problem; Universality. (4.2–4.3)

**03/19** Recursively Enumerable Sets. (4.4–4.5)

**03/26** Diagonalization and Reducibility. (4.6–4.8)

**04/02** A Computable Function That Is Not Primitive Recursive. (4.9)

**04/09** Turing Machines. (6.1–6.4)

**04/16** *mid-term examination*

**04/23** Nondeterministic Turing Machines; Semi-Thue Processes. (6.5–6.5; 7.1–7.2)

**04/30** Post's Correspondence Problem. Grammars. (7.2–7.6)

**05/07** Regular Languages, Part 1. (9.1–9.4)

**05/14** Regular Languages, Part 2. (9.5–9.7)

**05/21** Context-Free Languages, Part 1. (10.1–10.4)

**05/28** Context-Free Languages, Part 2. (10.5–10.9)

**06/04** Context-Sensitive Languages. (11.1–11.3)

**06/11** Polynomial-Time Computability. (15.1–15.4)

**06/18** *final examination*

## Textbook

Martin Davis, Ron Sigal, and Elaine J. Weyuker. *Computability, Complexity, and Languages: Fundamentals of Theoretical Computer Science*, 2nd edition. February 1994, Morgan Kaufmann. ISBN: 0122063821.

## Grade

Homework (50%) and examination (50%).