

# 計算理論 Theory of Computation (705 30400)

(updated 2010-03-08)

Spring 2010

## Time and Place

Wed. 15:30 – 18:20; Room B102, Management Building I.

## Course Web Site

<http://www.iis.sinica.edu.tw/~trc/public/courses/Spring2010/>

## 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

蔡淳宇, e-mail: [eshiland@gmail.com](mailto:eshiland@gmail.com)

Office hours: Fri. 12:30 – 13:30; Room 503-C, Management Building I. Office Phone numbers: 02-3366-1203.

## Schedule (subject to adjustment)

**02/24** Preliminaries; A Programming Language. (1; 2.1–2.2)

**03/03** Computable Functions; Primitive Recursive Functions. (2.3–2.5; 3.1–3.4)

**03/10** Coding Programs by Numbers. (3.5–3.8)

**03/17** The Halting Problem; Universality. (4.1–4.3)

**03/24** Recursively Enumerable Sets. (4.4–4.5)

**03/31** Diagonalization and Reducibility. (4.6–4.8)

**04/07** (*no class on 04/07*)

**04/14** A Computable Function That Is Not Primitive Recursive. (4.9)

## 04/21 mid-term examination

**04/28** Regular Languages, Part 1. (9.1–9.4)

**04/05** Regular Languages, Part 2. (9.5–9.7)

**05/12** Context-Free Languages, Part 1. (10.1–10.4)

**05/19** Context-Free Languages, Part 2. (10.5–10.9)

**05/26** Calculations on Strings (5.1–5.6)

**06/02** Turing Machines (6.1–6.5)

**06/09** Abstract Complexity (14.1–14.4)

**06/16** (*no class on 06/16*)

## 06/23 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.

**Two copies of the first edition of the textbook are reserved in the main library.**

## Grade

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