PHYS S0267 / Statistical Mechanics I / Spring 2009

- **Course Description**

  Statistical Mechanics I is a one-semester course required for all Master students in physics. It aims to introduce the fundamental concepts of statistical mechanics and their applications to investigate the properties of matter.

- **Lectures**

  Wednesday 14:10–15:00; Thursday 10:10–12:00 in S314

- **Office Hours**

  Tuesday 10:10–12:00, Thursday 14:10–15:00, and by appointment

- **Lecturer**

  Prof. Shang-Yung Wang (Office: Sa123; Ext: 3160; Email: `sywang(at)mail.tku.edu.tw`)

- **Course Web Page**

  Course information and homework available online at
  `http://taos.phys.tku.edu.tw/moodle`

- **Textbook and References**

  1. J. P. Sethna, *Statistical Mechanics: Entropy, Order Parameters and Complexity*, Oxford University Press, 2006 (Textbook)
     - An electronic version of the book is available on the author's web page, however, make sure *not* to violate the explicitly stated copyright rules concerning hard-copy printing.
     - The printed version is imported and distributed in Taiwan by the Sci-Tech Publishing Company.
  2. S.-K. Ma, *Statistical Mechanics*, World Scientific, 1985 (Reference, on reserve in the Library)
  3. R. K. Pathria, *Statistical Mechanics*, Butterworth-Heinemann, 2nd edition, 1996 (Reference, on reserve in the Library)

- **Class Attendance**

  Attendance at lectures is highly recommended but not required. You are strongly encouraged to ask questions during the lectures.

- **Midterm and Final Exam**

  To be announced

- **Grading (tentative)**

  Homework (20%), Midterm (40%), and Final (40%)

- **Plan of Lectures (tentative)**

  1. Random walks and emergent properties
  2. Temperature and equilibrium
  3. Phase-space dynamics and ergodicity
  4. Entropy and free energies
  5. Quantum statistical mechanics