

THERMAL AND STATISTICAL PHYSICS

(2014 Fall: Department of Applied Physics)

Instructor: Prof. Suenne Kim (김수은)

Office: Science Building 1, Room #2-126

Phone:

E-mail:

Lecturing Hours:

Tuesday (9:00 –10:30)

Thursday (9:00 –10:30)

Office Hours:

Tuesday & Thursday: 10:30 – 11:30am or by appointment. To schedule, send me an email or feel free to call me anytime.

Evaluation:

1. Attendance + Attitude (10%)
2. Midterm (40%)
3. Final examinations (50%)

Textbook & References :

- Textbook – Daniel V. Schroeder, “*An Introduction to Thermal Physics,*” International edition (Publisher: Addison-Wesley)
- Reference – Charles Kittel, Herbert Kroemer, “Thermal Physics,” 2nd edition (Publisher: W. H. Freeman)

Overview of the Course:

Thermal Physics deals with collections of large numbers of particles but not their individual characteristics. That is, we study overall properties that do not controlled by microscopic details of particles. The textbook divides related topics into three main parts, which is Fundamentals, Thermodynamics, and Statistical Mechanics.

Five to ten problems will be assigned as homework at the end of each chapter and there will be one or two quiz tests at the beginning of every class.

Topics include: Introduction, Temperature and ideal gas, Energy and Work and 1st Law of thermodynamics, Transport Phenomena, Macrostates and Microstates, Entropy and 2nd Law, Entropy and Temperature, Ideal Gas: Equation of state, Thermodynamic identities, Heat Engines, Refrigerators, Thermodynamic potentials, Phase Equilibrium, van der Waals gas, Binary mixtures, Dilute solutions, Chemical reactions, Canonical Ensemble, Boltzmann statistics, and quantum statistics.

Tentative Weekly Course Schedule:

1 week: Orientation, CH1: 1.1— CH1: 1.4

2 week: CH1: 1.5

3 week: CH1:1.6—CH2:2.2

4 week: CH2: 2.3— CH2: 2.4

5 week: CH2: 2.4— CH2: 2.6

6 week: CH3: 3.1— CH3: 3.3

7 week: CH3: 3.4— CH4: 4.1

8 week: CH4: 4.2— CH4: 4.4

9 week: CH5: 5.1— Midterm

10 week: CH5: 5.2— CH5: 5.6

11 week: CH6: 6.1— CH6: 6.3

12 week: CH6: 6.4— CH7: 6.6

13 week: CH6: 6.7— CH7: 7.2

14 week: CH7: 7.3— CH7: 7.4

15 week: CH7: 7.5— CH7: 7.6

16 week: Review-Final exam