

Physical Chemistry of Materials (2008 Spring Semester) Syllabus

I. Mandatory Topics

PART I Equilibrium

: The concepts are needed for the discussion of equilibrium and the direction of spontaneous change in terms of thermodynamics

1 week - 1. The properties of gases (2h) : 1.1, 1.2, 1.3, 1.4, 1.5

2 week - 2. The First Law : (5h) : 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12

3 week - 3. The Second Law : (5h) : 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9

4 week - 4. Physical transformation of pure substances (3h) : 4.1, 4.2, 4.4, 4.5, 4.6, 4.7

5 week - 5. Simple mixtures (4h) : 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9

6 week - Midterm Examination

7 week - 6. Phase diagram (2h) : 6.1, 6.2, 6.3, 6.4, 6.5, 6.6

8, 9 week - 7. Chemical equilibrium (7h) : 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9

PART II Change

: The ground for a discussion of the rates of reactions by considering the motion of molecules in gases and in liquids.

10 week - 21. Molecules in motion (4h) : 21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7, 21.8, 21.9, 21.10, 21.11, 21.12

11 week - 22. The rates of chemical reactions (3h) : 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8

II. Optional Topics

12 week - 23. The kinetics of complex reactions (3h) : 23.1, 23.2, 23.3, 23.4, 23.5, 23.7, 23.8

13 week - 24. Molecular reaction dynamics (4h) : 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.9, 24.10, 24.11, 24.12

14 week - Final Examination