

Physical Chemistry: Thermodynamics and Kinetics

CHEM-UA 652

Syllabus, Spring 2017

General Information

This subject deals with both chemical thermodynamics and chemical kinetics. The course provides you with the tools and understanding to handle basic problems involving chemical systems at equilibrium and rates of simple chemical reactions.

Topics include properties of gases, classical thermodynamics, and kinetics.

Lectures: location and hours

Tuesday, Thursday 2:00pm - 3:15pm 7 East 12th Street LL23

Instructor

Prof. Stefano Sacanna 666 Brown 212-998-83766
s.sacanna@nyu.edu

Office Hours: Fridays 4pm -6pm or by appointment

Prerequisites

- Math-UA 0122
- Phys-UA 0012 or Phys-UA 0093
- Chem-UA 0102 or Chem-UA 0104 or Chem-UA 0110 or Chem-UA 0112 or Chem-UA 0126 or Scien-AD 107 and Scien-AD 108 and Scien-AD 110
- with a minimum grade of C.

In other words: Two semesters of General Chemistry, two semesters of university introductory physics (with calculus), and at least two semesters of university calculus.

Text

- Book: "Physical Chemistry: A Molecular Approach", McQuarrie and Simon, University Science Books, 1997
- Additional course materials will be posted on the NYU Classes page.

Homework

Homework will be posted on the NYU Classes page. Homework is due at the beginning of the following recitation section.

Assigned Reading

Some additional materials for deeper and more detailed discussions will not be covered in full in class, but will be assigned as reading materials, and will be part of the course material tested at the exams / HW, and quizzes.

Quizzes

Quizzes will be given during class. Quizzes will not be announced. They will be composed of 2-3 questions similar to recent HW questions. Only calculator allowed. Common equations and constants will be provided. You can miss two quizzes for whatever reason without penalty.

Exams

There will be two midterms that will take place during the class period (tentatively on February 21st and March 21st), and one final exam (not yet scheduled). Location to be announced.

Only calculator allowed. Common equations and constants will be provided.

Grading

1st exam – 20%

2nd exam – 20%

Final Exam – 35%

Quizzes – 15%

Homework – 10%

Course Outline

Jan 24	Introduction to the Course, start Ch 16
Jan 26	Ch 16: The Properties of Gases
Jan 31	
Feb 02	Ch 19: The First Law of Thermodynamics
Feb 09	
Feb 07	Ch 20: Entropy and the Second Law of Thermodynamics
Feb 09	
Feb 14	Ch 21: Entropy and the Third Law of Thermodynamics
Feb 16	
Feb 21	First Midterm Exam
Feb 23	Ch 22: Helmholtz and Gibbs Energies
Feb 28	
Mar 02	Ch 23: Phase Equilibria
Mar 07	Ch 24: Liquid-Liquid Solutions
Mar 09	
Mar 14	NO CLASS
Mar 16	NO CLASS
Mar 21	Second Midterm Exam
Mar 23	Ch 25: Solid-Liquid Solutions
Mar 28	Ch 26: Chemical Equilibrium

Mar 30	Ch27: Kinetic Theory of Gasses
Apr 04	Ch28: Chemical Kinetics I: Rate Laws
Apr 06	
Apr 11	Ch 29: Chemical Kinetics II: Reaction Mechanisms
Apr 13	
Apr 18	Ch30: Gas-Phase Reaction Dynamics
Apr 20	
Apr 25	Ch 31: Solids and Surface Chemistry
Apr 27	
May 02	Statistical Thermodynamics Topics
May 04	Last day of classes

Recitations

You need to be registered for one of the recitation sections for this course (UA652 sections 102 / 103).

Sec 102: Monday, 11:00 am – 12:15 pm, at MEYR_261

Sec 103: Monday, 4:55 pm – 6:10 pm, at 25W4_C-13

Section leaders:

- 102&103 Long Zhuoran (zl1277@nyu.edu)

Course Site

The main course site is the NYU Classes page.