

CHEM 234: Physical Chemistry I: Thermodynamics Syllabus for Fall 2016 Term

GENERAL INFORMATION

This 3-credit course introduces the student to the principles governing the energy exchanges that accompany physical and chemical transformations. It has the following prerequisites: CHEM 205 and 206 (Gen. Chem. I & II); PHYS 204, 206, 224 and 226 (Mechanics & Waves and Modern Physics + Labs); and MATH 203 and 205 (Calculus I & II).

Course Format: Lectures

Instructor: **Dr. Guillaume Lamoureux**

Office: SP-201.09

Office Hours: Thursdays from 17:00 to 17:45 (before the lecture)

Any other time: By appointment

Email: guillaume.lamoureux@concordia.ca

Websites: Access from <http://moodle.concordia.ca/moodle/>
(also <http://faculty.concordia.ca/glamoure/teaching.html>)

Lectures: Thursdays from 18:00 to 20:30

Location: CC-308

Textbook: **Atkins & De Paula, *Atkins' Physical Chemistry*, 10th Ed., Volume 1.**

(available at the Concordia Bookstore)

The textbook is sold as a package that includes access to the book's website. It is highly recommended.

COURSE OUTLINE

The following topics will be covered: (1) properties of gases, (2) internal energy, enthalpy & the First Law, (3) entropy, free energy & the Second and Third Laws, (4) phase equilibrium, (5) simple mixtures, (6) chemical equilibrium.

COURSE GRADE

The final grade for the course is composed as follows: **25% for the first midterm exam, 25% for the second, and 50% for the final exam.** The minimum passing grade for the course is 50%.

EXAMINATIONS

The midterm exams will be held on **September 29** and **October 27**. The final exam date is set by the Examinations Office. If a student is absent from a midterm, he/she must produce a written excuse appropriately signed (e.g., by a doctor or an employer) on letterhead paper. This letter must be delivered to the instructor **no later than one week after the exam**. The Department determines the validity of the absence. If the absence is not valid, the student will receive a mark of zero for the exam. If it is valid, the two other exams will be worth 100% of the final grade.

PLAGIARISM AND OTHER FORMS OF ACADEMIC DISHONESTY

The academic code of conduct can be found in section 17.10 of the Undergraduate Calendar (<http://www.concordia.ca/academics/undergraduate/calendar/current/17-10.html>). Any form of unauthorized collaboration, cheating, copying or plagiarism found in this course will be reported and the appropriate sanctions applied. Ignorance of these regulations is no excuse and will not reduce the sanction.

READING MATERIAL AND PRACTICE PROBLEMS

The student is expected to read the appropriate sections of the textbook—ahead of time, ideally (to get the most out of the lectures). There are no graded assignments for this course, but a list of suggested practice problems from the book will be provided with each section. It is the student's responsibility to use these problems to practice in applying the course material.

CALENDAR OF LECTURES

Please note that this calendar may change as the semester proceeds. The chapter numbers refer to the 10th edition of the textbook.

Date	Topics	Reading
Sep. 8	Introduction, The perfect gas, Real gases	1A–1C
Sep. 15	The First Law	2A–2B
Sep. 22	Thermochemistry Problems in class	2C
Sep. 29	Midterm Exam #1 (covers Chapters 1 and 2)	
Oct. 6	The Second and Third Laws, Helmholtz and Gibbs energies	3A–3C
Oct. 13	Combining the First and Second Laws Problems in class	3D
Oct. 20	Phase diagrams, Phases transitions	4A–4B
Oct. 27	Midterm Exam #2 (covers Chapter 3)	
Nov. 3	Simple mixtures, The properties of solutions	5A–5B
Nov. 10	Phase diagrams of binary systems Problems in class	5C
Nov. 17	Activities	5E–5F
Nov. 24	Chemical equilibrium	6A–6B
Dec. 1	Problems in class	
TBA	Final Exam (covers Chapters 3 (again), 4, 5, and 6)	