

## PHYSICAL CHEMISTRY I

CHE 360-001

FALL 2003

**All items on this syllabus are subject to change by the instructor.**

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Office Hours: 7:30-8:00 AM MWF (in SC 402)  
9:05-9:45 AM MF  
11:00 - 11:50 AM MWF  
other times by appointment

Class Schedule: 8:00-8:50 AM, MWF, SC 402

Prerequisite: CHE 121, MAT 220, and PHY 222 or 213

Text: *Physical Chemistry*, 5th ed., by Ira M. Levine.  
The first 14 or 15 chapters will be covered.

Optional Supplement: *Student Solution Manual to Accompany Physical Chemistry, 5th ed.*,  
by Ira Levine

Regular Exams (4): 100 points each

Tests: Four regular tests, 100 points each. Final exam, 150 points; homework and class assignments or quizzes, 0-150 points. The lowest regular test (or part of the final, if it is lower than any of the 4 regular tests) will be dropped. If a regular test is missed for any reason, that will be the one dropped. If more than five quizzes are given, the lowest quiz will be dropped; if twelve or more quizzes are given, the lowest two quizzes will be dropped. Assigned homework may be taken up and graded if advanced notice is given. The final exam will consist of two parts, a standardized ACS test and a portion written by the instructor covering Chapter 14 and possibly 15.

Regular tests usually require more than one hour and some may be scheduled outside the normal class period. Use of a hand calculator is suggested for regular tests and for the final exam.

Notes: The final exam at the end of CHE 361 is a standardized exam covering both semesters of physical chemistry (CHE 360 and CHE 361).

Last day to drop with a "W" is November 1.

Students are responsible for reading and understanding all items on this syllabus. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.

Grade Scale (%):	A	90 - 100
	B	80 - 90
	C	70 - 80
	D	60 - 70
	F	below 60

Test 1	Chapters 1, 2, 3
Test 2	Chapters 4, 5, 6
Test 3	Chapters 7, 8, 9, 10
Test 4	Chapters 11, 12, 13
Exam	Comprehensive (includes 14 and possibly 15) Wednesday, Dec 17 8:00-10:00 AM (a portion of the final may be scheduled at a different time)

The work you will do in this course is subject to the Student Honor Code. The Honor Code is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements.

## CHE 360 Assigned Problems

Chapter	Page	Problems
1	34	1.1, 1.3, 1.9, 1.20, 1.21, 1.25, 1.27, 1.31, 1.34, 1.40, 1.43*, 1.50, 1.54, 1.60, 1.65, 1.69 * add (b) Find an expression for dz, the total differential
2	74	2.33, 2.34, 2.37, 2.39, 2.44, 2.46, 2.47, 2.48, 2.49, 2.50, 2.51, 2.55, 2.59, 2.66, 2.67, 2.59. May browse 2.69 (True/False)
3	103	3.2, 3.10, 3.11, 3.13, 3.15, 3.17, 3.18, 3.19, 3.22, 3.28 (just note solution; need not do), 3.31, 3.34, 3.42, & Additional "Find $\Delta S$ for each ideal gas process of Prob. 2.51 and $\Delta S$ for the entire cycle"
4	136	4.11, 4.13, 4.14, 4.16, 4.17, 4.18, 4.27, 4.29, 4.32, 4.33, 4.38, 4.47, 4.48. 4.51, 4.59
5	170	5.2, 5.5, 5.10, 5.15, 5.16, 5.18, 5.24, 5.25, 5.27(also fit $C_{P,m}=A+BT+CT^2+D/T^2$ ) 5.38, 5.39 (also find $\Delta G^\circ_{370}$ ), 5.44, 5.49, 5.52, 5.60, 5.61, 5.63, 5.64. Note how worked: 5.33, 5.55
6	198	6.4, 6.11, 6.18, 6.19, 6.22, 6.23, 6.24, 6.31, 6.35, 6.36, 6.37, 6.46, 6.49, 6.50, 6.51, 6.63 (T/F)
7	226	7.3, 7.5, 7.14( sketch phase diagram), 7.18, 7.23, 7.24, 7.28, 7.29, 7.31, 7.34, 7.35, 7.44, 7.47, 7.50, 7.55 Note: some answers use older $\underline{H}_{tr}$ rather than $\underline{tr}H$ .
8	221	8.2, 8.7, 8.9, 8.19, 8.21, 8.31 (add [a] by using (8.27)), 8.32, 8.35, 8.36 ( <u>note only</u> ), 8.38, 8.41, 8.42
9	276	9.12, 9.13, 9.25, 9.27, 9.35, 9.36, 9.37, 9.38, 9.44, 9.47, 9.50, 9.52, 9.65, 9.55
10	314	10.6, 10.7, 10.11, 10.13, 10.25, 10.26, 10.28, 10.36, 10.37, 10.47, 10.50, 10.61, 10.62, 10.64, 10.70 10.13 Just note that can get one activity coefficient from another
11	337	11.8, 11.10, 11.11, 11.12, 11.13, 11.19, 11.25, 11.27 (should be $\underline{\pm}^\dagger$ not $\underline{\pm}$ ), 11.28, 11.29, 11.30, 11.31, 11.37, 11.38, 11.44, 11.47 11.16 May do if time; similar to 11.28 11.21 Need not work out; just note $K^\circ_{ca} \approx K^\circ_{ma}$ as $m_i \approx c_i$ dilute aq.soln. 11.43 Biochemists should note
12	378	12.3, 12.7, 12.9, 12.14, 12.18, 12.31, 12.36, 12.39, 12.44, 12.45, 12.46, 12.48, 12.49, 12.64, 12.66, 12.72 12.16 = $0.713 \text{ atm} \times \frac{760 \text{ mm Hg}}{1 \text{ atm}} \times \frac{\text{eHg} (13.6 \text{ g/cm}^3 \text{ at } 25^\circ\text{C})}{\text{eH}_2\text{O} (0.997 \text{ g/cm})} = 7.4 \text{ m}$
13	406	13.4, 13.5, 13.9, 13.10, 13.11, 13.24, 13.25, 13.32, 13.34 (optional), 13.35 13.7 just note small size
14	451	14.5, 14.17, 14.24, 14.27, 14.29, 14.35, 14.38, 14.41, 14.46, 14.47, 14.49, 14.51, 14.55, 14.62, 14.68