SYLLABUS

CHEM 231-001 Physical Chemistry I

Fall 2016

Instructor: Kathleen Gilbert, PhD, PE Department of Chemistry and Env. Science NJIT, Newark, NJ 07102 Email: <gilbert@njit.edu> (best way to contact!) **See instructor after the first session regarding use of earlier editions of the text.**	**Classes:** Th 9/8/16 through M 12/12/16**:** MTh 10 – 11:25 am in Tier 107 Class on T 11/22/16; no class on Th 11/24/16. There are some required Moodle assignments.
TEXTBOOK: Atkins & dePaula, **Physical Chemistry,*10th Edition.*** ***e*Books are NOT recommended – see below.**	
Office hours: By appointment only; email the instructor.	

CHEM 231. Physical Chemistry I. 3 credits, 3 contact hours (3;0;0). Prerequisites: CHEM 122 or CHEM 126, PHYS 111 with a grade of C or better. Corequisite: MATH 211. The topics covered include the properties of ideal and non-ideal gases and liquids, solutions, thermochemistry, thermodynamics, the phase rule, and phase equilibria.	**Course Grading**: Worksheets & HW Demonstrations 8% Quizzes 22% Exam 1 20% Exam 2 20% Exam 3/Final 30% **Total 100%**

Notes on Worksheets and Homework Demos

- Worksheets are required and will be given on days when there is neither a quiz nor an exam. Missed worksheets for any reason will NOT be made up; they will either be a zero or averaged out, depending on if there is a Dean of Students approved excuse.
- Homework assignments will not be collected or graded, however students will be required to demonstrate assigned exercises or problems in front of the class by writing on the board and describing their work step by step , as noted in the first session. The number of homework demonstrations required is based on class size and will be communicated the first day of class.

Notes on Quizzes and Exams

- There will be three quizzes in class throughout the semester to ensure each student is completing the homework assignments in a timely manner. Quizzes are 40 minutes. Exams are 85 minutes.
- All quizzes and exams are open book ONLY – closed notes and no extra papers allowed in your textbook. Only one print copy of Atkins' Physical Chemistry, any edition, is allowed during the quizzes and exams. No other books or papers. *Tiny* bookmarks of size less than 1/2" x 1" are allowed. Writing in the textbook is allowed; renters are advised to use *tiny* post-it note pieces.

- No eBooks, or any other electronic devices except for calculators are allowed during quizzes and exams. You MUST use a print copy of the text book, or use no book at all during the quizzes and exams.
- *Some* progammable/graphing calculators are allowed during quizzes and exams, however Texas Instruments TI89, TI92 Plus, NSpire, TI89 Titanium, Voyage 200, and any model of Calctimate. Be advised that ANY calculator that appears to have Internet or file access during the exam will be subject to review by the TA or instructor writing down the make and model, and clarifying that the calculator does not violate the class rules. The TA and instructor reserve the right to take a photo of the calculator in question to verify the make and model of the calculator.
- Note that because other graphing and programmable calculators are allowed, ALL WORK must be shown. This includes the equation with variables and parameters only, and the equation with all numbers. Missing steps WILL result in lost points. Correct answers without proper work will not receive credit.

Notes on Class Attendance:

- Students who miss class due to a valid personal or medical reason MUST contact the Dean of Students office with the valid excuse and get it approved. The Dean of Students will then contact me and any other professors whose classes were missed. Missed worksheets, quizzes, or exams without a Dean of Students approved excuse will result in a zero grade.
- No student will be exempted from demonstrating homework; if there is a Dean of Students approved excuse for their homework demonstration date, that student will either demonstrate the same homework question later or sign up for another exercise or problem. Students are advised to do their homework demonstrations EARLY in the semester to avoid any issues due to absences.
- The instructor reserves the right to assign online Moodle assignments, including viewing unnarrated or narrated lectures or taking brief online quizzes (separate from the in-class quizzes), as needed to make up class time. Online quizzes will count as worksheets. Viewing online lectures is the responsibility of the student. Material found only online WILL be fair game for quizzes and exams.

Notes on Grading:

- The default grading scale is as follows:

Letter Grade	Overall Class Percent
A	90 or above
B+	85 - 89
B	80 - 84
C+	75 - 79
C	70 - 74
D	60 - 69
F	59 or below

Departures from this grading scale will be considered on a class-wide basis for individual semesters.
In every case, the increments of the grading scale will remain the same.
Only exact percentages will be considered; example would be an overall class percent of 79.9% is a C+ not a B using this grading scale.

COURSE SCHEDULE – CHEM 231 FALL 2016 GILBERT (Atkins 10th Edition Chapters)

Th 9/8, M 9/12, Th 9/15, M 9/19	Intro and Ch. 1 Gases (1A, 1C)
Th 9/22, M 9/26*, Th 9/29, M 10/3, Th 10/6, M 10/10	Ch. 2 First Law (all), ***Quiz #1***
Th 10/13 *EXAM 1*	**EXAM 1** (Ch. 1 & 2 Gases, First Law) - ***Sections noted above***
M 10/17, Th 10/20, M 10/24, Th 10/27*, M 10/31, Th 11/3	Ch. 3 Second and Third Laws (all) , ***Quiz #2***
M 11/7 **EXAM 2**	**EXAM 2** (focusing on Ch. 3 Second and Third Laws) - ***Sections noted above*** – **Sections noted above**

*****************Monday November 7th 2016 is last day to withdraw*****************

Th 11/10, M 11/14, Th 11/17, M 11/21, T 11/22*	Ch. 4 Physical transformations of pure substances (4A , 4B.1, 4B.2), ***Quiz #3***
M 11/28, Th 12/1, M 12/5, Th 12/8, M 12/12	Ch. 5 Simple mixtures (5A, 5B, 5C, 5E, 5F)
TBD * FINAL EXAM ***** *F 12/16/16 - Th 12/22/16*	**EXAM 3** (focusing on Ch. 4 & Ch. 5 Physical transformations of pure substances, Simple mixtures) **- Sections noted above**

Quizzes * will be announced during the class before the quiz or earlier. There will be three quizzes, and the lowest quiz grade dropped. Quizzes will last 40 minutes with class held afterwards, and be open book closed notes as noted above for exams. Exams are 85 minutes.

THIS SYLLABUS MAY CHANGE BASED ON MATERIAL COVERED AND OTHER FACTORS.

Please review the NJIT Integrity Code; any indications of CHEATING on any quiz or exam will be treated seriously according to NJIT policy and procedures. Do NOT risk your college career for a few points!!!

Measures not limited to retaining copies of graded quizzes and exams, and moving students during quizzes or exams may be used to minimize the occurrence of cheating. Please note that ENTIRE CLASSES have been punished under the NJIT Integrity Code - knowing that others are cheating is not an excuse to cheat! In certain cases, not reporting cheating including letting someone copy from your quiz or exam paper can result in YOU being brought before the NJIT Integrity Board. DON'T BECOME AN EXAMPLE OF WHAT NOT TO DO!

Any assignment that can be worked on with others or with the use of the Internet will be clearly identified as such. In this class, worksheets are meant to be worked on together or with the assistance of the Internet if students so choose. The instructor reserves the right to ask to see and review the written work for the online homework problems.

A reminder that quiz and exam material may come from ANY covered material in the textbook and the lectures. If there is not a specific homework exercise or problem on the topic, that does not mean there will not be a quiz or exam question on that same topic. Be prepared for anything that is covered by the lectures, online material, and the textbook!

Homework Problems. Please complete the homework problems before the class problem demonstration session to ensure maximum benefit. Problem numbers are for the 10th edition of Atkins and dePaula, which is ordered by a lettered section within a numbered chapter; the homework is ordered the same way. Homework is found at the very end of each chapter, after the text of all sections.

There will be a signup sheet with demonstration day and a place for student initials to reserve a demo.

Atkins' Physical Chemistry TENTH (10th) Edition Homework		
Ch.	**Exercises**	**Problems**
1	1A.1a, 1A.2a, 1A.3a, 1A.7a, 1A.12a, 1C.4b, 1C.7a	1A.1, 1A.3, 1C.2, 1C.3, 1C.7
2	Online Ch. 2 #1 - #5 2A.5a, 2A.6a, 2B.2a, 2B.3a, 2C.3b, 2C.4a, 2C.5a, 2C.9a, 2C.10a, 2D.2a, 2D.3a	 2A.2, 2B.3, 2C.6, 2C.7, 2D.3, 2D.4, 2E.1
3	Online Ch. 3 #1 - #5 3A.11a, 3B.2a, 3C.2a, 3C.3a, 3C.4a, 3D.2a, 3D.3a, 3D.4a	 3A.7, 3A.9, 3B.2, 3D.1, 3D.3
4	4A.1a, 4A.2a, 4A.3a, 4B.1a, 4B.5a,4B.6a, 4B.7a, 4B.8a, 4B.13a	 4B.2, 4B.3, 4B.4, 4B.5, 4B.8
5	5A.7a, 5A.9a, 5A.11a, 5B.3a, 5B.5a, 5B.7a, 5B.8a 5C.1a, 5C.2a, 5C.3a, 5C.7a, 5C.10a, 5E.1a, 5E.2a, 5F.1a, 5F.3a	5A.3, 5C.1, 5C.2, 5C.4, 5C.6, I.A. 5.1

I.A. is "Integrated Activity" - found after all other exercises and problems in a chapter.

There are 61 exercises and 28 problems. For 14 students, that means demonstrate a total of three exercises and two problems, with a few extra exercises that won't be demonstrated.

Learning outcomes for Chem 231:

By the end of the course, you should be able to do the following:
1. Calculate pressure and molar volumes of ideal as well as real gases.
2. Determine the efficiency of heat engines.
3. Derive the basic thermodynamic relations and to state the approximations and the applicability.
4. Calculate the thermodynamic functions of components in pure compounds and simple mixtures.
5. Calculate thermodynamic functions of chemical reactions at reference as well as arbitrary temperatures.
6. Calculate the location of phase boundaries for pure substances.
7. Calculate properties of simple mixtures.