CHE3301 - Physical Chemistry I - Spring 2018

Lectures: 
Tu 8:00 - 9:20 am 
Th 8:00 - 9:20 am 
Location: 164 Beury Hall

Lecturer: 
Prof. Yugang Sun 
Office: SERC 654 
Office hours: Tu 1-2pm, Th 1-2pm or by appointment 
E-mail: ygsun@temple.edu

TA: 
Dr. Jun Han 
Office: BE 203 
Office hours: Tu 10am-12pm or by appointment 
E-mail: junhan@temple.edu

Course description: 
Chemistry 3301 is designed as an introduction to the fundamental principles of Physical Chemistry. The majority of the topics to be covered will involve the laws of Thermodynamics and their applications. The remainder of the semester (if there is) will introduce chemical kinetics.

Course materials: 
• Solutions for textbook (optional but strongly recommended) – Student Solutions Manual. 
• Calculator is necessary for problem solving for homework and examinations.

Course Schedule: 
Attached to this syllabus is an outline for the first five weeks of the course. The outline gives the subject matter that will be presented at each lecture (It may be slightly changed subject to campus closing). Additional outline/assignment sheets will be given out as necessary. I will keep you informed if the sequence of material or its presentation date differs significantly from that in the assignment sheet.

Pre- and Co-Requisites: 
Two semesters of calculus and one semester of calculus-based physics are required. This course will be extremely difficult to complete at a satisfactory level without proper preparation in calculus.

Incompletes: 
The grade of "I" (i.e., incomplete) will only be given for extraordinary circumstances and under the guidelines set by the University. The student must have completed the majority of the work at a passing level to be considered for an "I". In the event an "I" is given, there will be a written agreement between the student and me which outlines the work that needs to be completed and the default grade that will be given if the work
is not carried out in the stated time-frame.

**Reading and problem assignments:**

Except for the first lecture, it is recommended that the reading listed in the course assignment sheet should be completed in advance of the associated lecture. The first two reading assignments should be completed before the second lecture.

A sheet with several problems will be handed out approximately every week that you will be required to solve and hand in for grading a week after they were issued. One or more problems out of this set will be graded, but all or variations of these problems may appear on the examinations. The solutions to the problems will be posted on Canvas.

In general, the more problems you do and understand, the better you will understand the subject matter. Hence, in addition to the assigned problems that are graded, solving additional problems given in the textbook is strongly recommended. You can check your work by using the *Student Solutions Manual*, and these problems will not be graded. These problems will also help you determine areas in which you may have an incomplete understanding for which you should seek help from me or your TA. You are welcome to submit questions (or comments) via e-mail. I will make every attempt to answer these e-mails promptly (within 2 days depending on the volume). Please remember that if your question requires a detailed response, it is probably better dealt with during office hours where it is easier to help you.

**Lectures:**

The lectures may not always follow the required textbook's presentation style or sequence in order to offer an alternate way of thinking about a subject. You are, however, responsible for both the lectures and materials covered in the textbook. Lectures will also make you aware of areas that will be emphasized on examinations.

**Recitations:**

There is a recitation period set aside for each student taking this course. The recitation will concentrate on problems that I hand out during the week or from problems taken from your textbook. Quizzes will also be given in recitations about every other week. Prior to exams, this period can also be used as a review.

**Examinations:**

Two exams will be given during the semester. The first is scheduled for February 22 and the second for April 12. You will be notified well in advance of each exam (at least two weeks) if the exam date needs to be moved. Please note that there will be no make-up examinations. Only documented excuses in extraordinary circumstances will be accepted.

**Grading:**

The final grade in the course is based on the total number of points accumulated over the semester in homework/quiz, midterm exams, and the final exam. The % breakdown is as follows:

- 2 midterm exams: 50%
- homework/quiz: 15%
- final exam: 35%

**Students with disabilities:**

Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific condition as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.
## CHE 3301- Physical Chemistry I / Spring 2018

### Schedule Sheet #1

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Subject</th>
<th>Reading Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tu 1/16</td>
<td>Introduction, perfect gas laws, equation of states</td>
<td>1A.1-1A.2</td>
</tr>
<tr>
<td>Th 1/18</td>
<td>Kinetic model, Dalton’s Law, Real gases</td>
<td>1B.1</td>
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<td></td>
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<td>1C.1-1C.2</td>
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<tr>
<td>Tu 1/23</td>
<td>First Law of thermodynamics, Internal Energy (U), work (w), and heat (q)</td>
<td>2A.1-2A.4</td>
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<tr>
<td>Th 1/25</td>
<td>Enthalpy (H), Calculation of enthalpy</td>
<td>2B.1-2B2; 2C.1; 2E.1-2E.2</td>
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<tr>
<td>Tu 1/30</td>
<td>Properties of H and U, Joule-Thomson effect</td>
<td>2.D.1-2D.3</td>
</tr>
<tr>
<td>Th 2/1</td>
<td>Thermochemistry</td>
<td>2C.1-2C.4</td>
</tr>
<tr>
<td>Tu 2/6</td>
<td>Second law of thermodynamics, Entropy (S), The Carnot cycle</td>
<td>3A.1-3A.3</td>
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<tr>
<td>Th 2/8</td>
<td>Properties of entropy, Calculation of entropy, Third law of thermodynamics</td>
<td>3A.4; 3B.1-3B.2</td>
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<tr>
<td>Tu 2/13</td>
<td>The Clausius inequality, Criteria of spontaneity, Helmholtz energy, Gibbs energy</td>
<td>3A.3; 3C.1-3C.2; 3D.2</td>
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<tr>
<td>Th 2/15</td>
<td>Fundamental Equations, Maxwell relations</td>
<td>3D1-2</td>
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<tr>
<td>Tu 2/20</td>
<td>Overview of gas law, First and second laws of thermodynamics</td>
<td>Chapter 1-3</td>
</tr>
<tr>
<td>Th 2/22</td>
<td>First midterm exam</td>
<td></td>
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