

# Physical Chemistry I (Chem 4110/6110)

## Course Syllabus – Fall 2017

**Instructor:** Samer Gozem  
**Office:** 504 Science Annex  
**E-mail:** sgozem@gsu.edu  
**Office Hours:** Wednesdays 2:00-4:00 P.M. or e-mail in advance.

**Graduate TA:** Thomas A. Embry Jr.  
**Email:** tembry1@student.gsu.edu

**Lecture time and place:** MWF 11:00 – 11:50 A.M. in Langdale Hall 203.

**Course Prerequisites:** This course relies on chemistry, physics and math concepts from Chem 1212K; Math 2212; Phys 2211K, and Phys 2212K. Appendix B in the textbook is a good resource for reviewing important mathematical relationships and concepts that will be used in this class.

**Textbook:** "Thermodynamics, Statistical Thermodynamics and Kinetics" 3rd Ed. by Engel and Reid, Pearson 2013. ISBN 978-0-321-76618-2.

**E-Text:** Prentice Hall offers a 360 day online / downloadable version of the textbooks:  
<https://www.vitalsource.com/products/thermodynamics-statistical-thermodynamics-amp-thomas-engel-v9780321941022>

**Course Description:** Physical Chemistry I is a 3 credit semester course that covers the principles of thermodynamics, transport and kinetics, and how they serve as the basis for interpreting and interrelating the properties of matter. Chapters 1-11 and 16-19 of the text will be covered.

**Course Objectives:** Understand the behavior of matter and transformation between different forms of energy as they relate to expansion and compression of gases, phase transitions, and chemical reactions.

**Help Sessions (Thomas Embry Jr.):** Special Course: CHEM 4111; Fridays from 1:00 - 2:40 p.m. at Arts & Humanities 327. All undergraduate students are strongly encouraged to register for this course. Graduate students should not register for this course but are also strongly encouraged to sit in and solve homework problems.

**Practice Problems:** Practice problems will be assigned to help you improve and test your knowledge of each of the topics covered in the course. These problems are solved in CHEM 4111 on Fridays. You should try to solve problems independently before the session on Friday and use the Chem 4111 session to go over questions or difficulties you had. Periodically, homework problems will be placed directly on the tests and many test questions will be very similar to homework problems.

**Quizzes & Exams:** There will be four quizzes. The lowest quiz score will be dropped. **The final ACS Exam must be completed and cannot be dropped.** Quizzes will not be given at any time other than the scheduled lecture period. Should you miss a quiz, you may use it as your drop grade. Therefore, you are allowed to miss one quiz, but you lose the opportunity to drop another quiz with a low grade.

### Grading:

**CHEM 4110:** The quizzes will count for **75%** of your overall grade. The ACS Exam will count for **25%** of the grade.

**HONORS CHEM 4110:** The quizzes will count for **60%** of the overall grade. The ACS Exam will count for **25%** of the grade. A list of 10 problems will count for **15%** of the overall grade. The list will be emailed at the end of the fourth week and the solutions are due on or before December 1<sup>st</sup>, 2017.

**CHEM 6110:** The quizzes will count for **60%** of the overall grade. The ACS Exam will count for **25%** of the grade. A list of 10 problems will count for 15% of the overall grade. The list will be emailed at the end of the fourth week and the solutions are due on or before December 1<sup>st</sup>, 2017.

The following plus/minus grading system will be used for everyone:

| <u>Grade</u> | <u>%</u> |
|--------------|----------|
| A+           | 100      |
| A            | 90-100   |
| A-           | 87-90    |
| B+           | 83-87    |
| B            | 80-83    |
| B-           | 77-80    |
| C            | 73-77    |
| C            | 70-73    |
| C-           | 67-70    |
| D            | 60-67    |
| F            | < 60     |

### Last day to withdraw: Tuesday, October 10th, 2017

The University requires faculty, on a date set by the Provost after the mid-point of the course,

1. to give a WF to all those students who are on their rolls but no longer taking the class, and
2. to report the last day the student attended or turned in an assignment.

**Student Integrity Policy:** All assignments, exams and tests taken must represent your individual, unaided efforts. Receiving unauthorized outside information or offering unauthorized information to another student during an examination is cheating. Any suspected offenses may be referred to the Department of Chemistry and the College of Arts and Sciences for appropriate action.

### Tentative Course Schedule:

**Holidays:** Labor day: September 4<sup>th</sup>, 2017, Thanksgiving break: November 20-24<sup>th</sup>, 2017

| <u>Dates</u>        | <u>Chapter</u>  | <u>Subject</u>                                    |
|---------------------|-----------------|---|
| 8/21, 8/23          | 1               | Ideal and Van der Waals Gases                     |
| 8/25, 8/28, 8/30    | 2               | Work, Heat, First Law of Thermodynamics           |
| 9/1, 9/6, 9/8, 9/11 | 3, 4            | Energy, Enthalpy, Thermochemistry                 |
| 9/13                | 1-4             | Quiz 1  |
| 9/15, 9/18, 9/20    | 5               | Entropy, 2 <sup>nd</sup> and 3 <sup>rd</sup> laws |
| 9/22 – 10/4         | 6               | Chemical Equilibrium                              |
| 10/6                | 1 – 6           | Quiz 2  |
| 10/9                | 7               | Real gases  |
| 10/11, 10/13, 10/16 | 8               | Phase diagrams                                    |
| 10/18 – 10/27       | 9, 10           | Solutions, Electrolytes                           |
| 10/30               | 11              | Electrochemical Reactions                         |
| 11/1                | 1 – 11          | Quiz 3  |
| 11/3, 11/6, 11/8    | 16, 17          | Kinetic Theory, Transport                         |
| 11/10, 11/13        | 18              | Intro to Kinetics                                 |
| 11/15 – 11/29       | 18, 19          | Kinetic Mechanisms, Enzyme Catalysis              |
| 12/1                | 16-19           | Quiz 4  |
| 12/4                | 1 – 11, 16 – 19 | Review  |
| 12/6, 10:45 A.M.    | 1 – 11, 16 – 19 | Final ACS Exam                                    |