CHEMISTRY 309/310
INSTRUCTOR: Jerome S. Levkov
OFFICE LOCATION: Cornelia 105
10:00
PHONE: 914 633-2279
FAX: 914 633-2240
Email: jlevkov@iona.edu

CLASS MEETING TIMES: Tu, W, F 8:00
CLASS LOCATION:
OFFICE HOURS: Tu 10:00, W 11:00, F 10:00
Or anytime by mutual agreement

COURSE DESCRIPTION:

Topics covered generally include:
- Solids, liquids and gases; solutions of non-electrolytes; elementary thermodynamics; kinetics;
- Homogeneous equilibrium; solutions of electrolytes; conductance; electromotive force; deviations from ideal behavior;
- Heterogeneous equilibrium and Phase Rule, introduction to atomic and molecular structure; energy of molecules, elementary statistical mechanics. Three lectures a week.

Prerequisite: CHM. 109-110; Math 232; PHY 101, 102

COURSE OBJECTIVES:

Physical Chemistry is the study of the molecular world and the interpretation of macroscopic properties and behavior in terms of the detailed properties and behavior of molecules. The course is designed for student who have had calculus and who have followed a modern approach in their elementary chemistry courses. The primary aim of the course is to instill in the student an appreciation and understanding of the basic concepts, their interrelationships and their applications in the development of modern chemistry, in particular the relation between the molecular and macroscopic.

Students leaving this course will be familiar with the basic principles of thermodynamics, kinetics, and quantum mechanics. They will have experience in applying these principles through solving illustrative problems.

PROCEDURES:

The class work consists of lecture and general clarification of fundamentals by class discussion where the instructor and students both pose and answer questions of each other. Student participation in these discussions is of primary importance in this course because it demonstrates constant acquisition of new knowledge, and the ability to relate previous understanding of fundamentals to newly acquired knowledge. Numerous problems are assigned for homework. Illustrative problems drawn from many areas are used in class.
REQUIRE TEXT:

Physical Chemistry by Keith J. Laidler, John H. Meiser, and Bryan C. Sanctuary

SUGGESTED SUPPLEMENT:


GRADING CRITERIA:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Hourly Exams</td>
<td>60</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30</td>
</tr>
<tr>
<td>Homework</td>
<td>10</td>
</tr>
</tbody>
</table>

POLICY ON PLAGIARISM AND ACADEMIC DISHONESTY:

ALL INSTANCES OF ACADEMIC DISHONESTY, CHEATING, AND PLAGIARISM WILL BE REPORTED TO THE OFFICE OF THE DEAN FOR ACADEMIC DISCIPLINE. ALL PAPERS, EXAMS, AND ASSIGNMENTS ON WHICH DISHONESTY IS CONFIRMED WILL RECEIVE A GRADE OF ZERO.

POLICY ON PLAGIARISM AND ACADEMIC DISHONESTY
<table>
<thead>
<tr>
<th>WEEK</th>
<th>CHAPTER</th>
<th>PROBLEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ch. 1, The Nature of Physical Chemistry and the Kinetic Theory of Gases, pp. 1-29</td>
<td>1: 1,4,5,6,7(b),8,9,12,16, 23,27,28</td>
</tr>
<tr>
<td>2</td>
<td>Ch. 1, (Cont’d.), pp. 29-43</td>
<td>1: 30,32(a),34,35,36,37,40 48,50,53,60</td>
</tr>
<tr>
<td></td>
<td>Ch. 2, The First Law of Thermodynamics pp. 49-59</td>
<td>2: 3,5,6,11,12</td>
</tr>
<tr>
<td>3</td>
<td>Ch2., The First Law of Thermodynamics pp. 59-86</td>
<td>2: 15 24,26,32,36,43,45</td>
</tr>
<tr>
<td>4</td>
<td>Ch.3, The Second and Third Laws of Thermodynamics, pp. 92-117</td>
<td>3: 1,2,5</td>
</tr>
<tr>
<td>5</td>
<td>Ch. 3, (Cont’d), pp.117-142</td>
<td>3: 6,7,10,12,17,18,20, 25,33,37,39,43, 44,56,57,59,62,64,65</td>
</tr>
<tr>
<td></td>
<td>exam I</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ch. 4, Chemical Equilibrium pp. 149-166</td>
<td>4: 1,4,7,15</td>
</tr>
<tr>
<td>7</td>
<td>Ch. 4 (Cont’d) pp. 166-174</td>
<td>4: 17,19,22,24,25,30, 33,36,37,41,43,49</td>
</tr>
<tr>
<td>8</td>
<td>Ch. 5 Phases and Solutions pp. 180-218</td>
<td>5: 1,3,7,9,21,22,23, 26,33,37,39,42,43, 48,49,54,55,58</td>
</tr>
<tr>
<td>9</td>
<td>Ch. 6 Phase Equilibria pp. 223-250</td>
<td>6: 1,3,7,9,11,13,18,21,24</td>
</tr>
<tr>
<td></td>
<td>EXAM II</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ch. 11 Quantum Mechanics and Atomic Structure pp. 494-535</td>
<td>11: 2,5,7,9,13,16(a),18,21</td>
</tr>
<tr>
<td>11</td>
<td>Ch.11 (Con’t) pp. 535-570</td>
<td>11: 25,26,30,34,36,38,40, 42,44</td>
</tr>
</tbody>
</table>
12. Ch.12 The Chemical Bond
   pp. 576-589;
   12: 1 (Excel)

13. Ch.12 (Cont’d)
    pp. 589-594, 600-621
    12: 2,3,4,16,17,18

EXAM III

14. Ch.12 (Cont’d) pp. 621-631;
    Ch.13 Foundations of Chemical
    Spectroscopy pp. 630-648
    13: 1,2,4,8

15. Ch.13 (Cont’d)
    pp. 648-658. 663-708
    13: 11,12,15,18,20,
        24,25,26,32

PLEASE NOTE THE FOLLOWING IMPORTANT DATES:

September 4 Mon: Labor Day – No Classes
October 9 Mon: Columbus Day – No Day Classes, Evening Classes in session
October 10 Tuesday: Day classes follow a Monday Schedule of Classes
November 15 Wed: Last day to withdraw from semester classes with a W
November 22-24 Wed: Thanksgiving recess
December 11 Mon: Last Day Fall Semester Day Classes
December 12 Tues: Reading Day
December 13 - 18: Examination period
December 19 Tues: Alternate Exam Day – Snow Day
January 22 : First Day of Spring Semester Classes