Chem 3620, Physical Chemistry II, Winter 2008  
Latest revision is 3/03/08

Class Times:  TTh 10:00 – 11:50 am, Olin 103  
Instructor: Sandra S. Eaton  
Office: Seeley G. Mudd Rm. 178  
Office Hours:  T Th 1-3 pm, or by appointment  

Text: *Physical Chemistry Volume 1: Thermodynamics and Kinetics*, P. Atkins and J. de Paula, 8th ed., Freeman, 2006 (designated as I) and  

OR  
*Atkins' Physical Chemistry*, P. Atkins and J. de Paula, 8th ed., Freeman, 2006 (designated as B)

### Course Outline

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading in Atkins and de Paula</th>
<th>Homework - E and P refer to Exercises and Problems from Atkins and de Paula</th>
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<tr>
<td>Jan. 3</td>
<td>Motion in Gases</td>
<td>I: 241-250 B: 747-756</td>
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<td>8</td>
<td>Motions in Liquids</td>
<td>I: 255-270 B: 761-776</td>
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| 10     | Rates of Reaction              | I: 285-297 B: 791-803          | I: E8.2a, E8.5a, E8.7a, E8.26a, E8.29a, P8.10  
                                                   B: same but ch. 21 |
| 15     | Rate Laws, Temperature Dependence | I: 298-303 B: 804-809          |                                                                                |
| 17     | Mechanisms and Rate Laws       | I: 303-309 B: 809-815          | I: E9.2a, E9.5a, E9.8a, E9.14a, P9.8  
                                                   B: same but ch. 22 |
| 22     | Mechanisms (cont.)             | I: 309-317 B: 815-823          |                                                                                |
                                                   B: same but ch. 22 |
| 29     | Collision Theory               | I: 363-372 B: 869-878          | I: E10.2a, E10.4a, E10.5a  
                                                   B: same but ch. 23 |
| 31     | Exam 1                         |                                 |                                                                                |
| Feb. 5 | Symmetry and Point Groups      | II: 162-170 B: 404-412         |                                                                                |
| 7      | Character Tables, Selection Rules | II: 171-183 B: 413-425         | I: E11.4a, E11.5a, E11.8a; II: E5.9a, E5.10a  
                                                   B: same but ch. 24 and 12 |
| 12     | Electronic Spectroscopy        | II: 239-250 B: 481-492         |                                                                                |
| 14     | Fluorescence, Phosphorescence  | II: 250-261 B: 492-505         | II: E5.12a, E5.13a, E7.1a, E7.2a, E7.11a  
                                                   B: same but ch. 12 and 14. |
| 19 | Photochemistry | I: 339-346  
     |               | B: 845-853 |
| 21 | Magnetic Resonance | II: 271-291  
     |               | B: 513-533  
     |               | II: P7.12, P7.14, P7.18;  
     |               | I: E10.7a, P10.10  
     |               | B: same but ch. 14 and 23 |
| 26 | Pulsed NMR | II: 291-301  
     |               | B: 533-549  
     |               | II: E8.6a, E8.7a, E8.13a  
     |               | B: same but ch. 15 |
| 28 | Exam 2 | | | |
| Mar. 4 | Electron Spin Resonance | II: 307-312  
     |               | B: 549-555 |
| 6  | Spin Density and Huckel Theory | II: 144-150  
     |               | B: 386-392  
     |               | II: E8.18a, E18.20a, E8.22a,  
     |               | P8.2, P8.10  
     |               | B: same but ch. 15 |
| 11 | Final exam – cumulative  
     |               | 9-11 am |

**Reading assignments**

Reading assignments are intended to prepare you for discussions in class. It is important that you read the material before coming to class and bring your questions with you.

**Homework**

Homework is very important to the learning process. The best way to understand the material for this class is to work problems. Homework will be assigned weekly, collected, and an answer key provided. The assignments will be added to the version of the course outline that is posted on Blackboard. If you have difficulty working an assigned problem it often is useful to try a similar problem from the end of the chapter for which the worked solution is provided in the student’s solution manual which is available in the bookstore. From each homework set one problem will be randomly selected for grading.

Part of the time during each class period will be spent working together on problems. Your contributions to these discussions will be part of your grade.

**Grading:** Class Participation - 10%, Homework - 15%, Exams - 25% each.