SYLLABUS  |  CHEMISTRY 31B: Chemical Principles II  |  Dr. Cardin  | Summer 2013

General Information & Course Structure

Instructor: Dr. Nate Cardin  nbcardin@stanford.edu
Teaching: Ian Smith  ismith9@stanford.edu
Assistants: Thomas Wilson  twilson2@stanford.edu

Website: After registering for Chem 31B on Axess, you should have access to the full Chem 31B Coursework website. This will be our primary means of communication, where you will be able to download any handouts, answer keys, and section materials.

Mastering Chemistry (Packaged with a new textbook)

Required iClicker: You must have an iClicker unit (available at the Stanford bookstore) to answer questions posed during lecture. iClicker questions will be used in class to provide immediate feedback on your understanding of the current material.

Make sure your iClicker is registered on Coursework for Chem 31B! (If you were enrolled in this summer’s Chem 31A, please use the same iClicker for both Chem 31A & 31B.)

Lectures: MTWTh 10 AM – 12 PM in Braun Lecture Hall

Sections: Sections will take place after lunch on most class days, from 1:15 PM – 3 PM. See the course calendar for a complete list of section dates. Section attendance is mandatory.

During section, you will work in small groups to observe and experiment with key chemical phenomena, develop models, and build your conceptual thinking skills.

If you did not take Chem 31A this summer, please download, read, and sign the “Chemistry Laboratory Course Safety Information and Agreement” document found on Coursework. Turn this document in to your TA at the beginning of the first section.

Office Hours: MTWTh 3 PM – 4:30 PM in Mudd 283
Office hours are available for students who need further clarification of concepts presented in lecture, or who have made solid attempts on the homework or practice problems and require further assistance working through them. Students are highly encouraged to rework misunderstood problems from returned exams with a TA or instructor during office hours.
**Grading System & Point Breakdown**

**Online Homework:** Using Mastering Chemistry software, you will be required to complete a small problem set nearly every day for homework. All problem sets will be due by **9 AM PST** the day after they are assigned. Problems will never be due on the day of an exam.

Each homework problem set is worth a maximum of 15 points. Eleven problem sets will be assigned throughout Chem 31B and the problem set with the lowest score will be dropped. The scores on the remaining ten problem sets will be summed to give your total homework score. A maximum score of **150 POINTS** is possible for all homework.

**iClicker Questions:** In Chem 31B, iClicker questions will be graded based on participation and accuracy. For each iClicker question, you will earn 1 point for simply participating and 1 point for selecting the correct answer (for a total of 2 possible points per question). At the end of the course, the total number of iClicker points you earn will be divided by the total iClicker points possible and scaled to a maximum of **50 POINTS**.

**Section Participation:** Section participation is worth 4 points per section for a maximum of **40 POINTS**.

**Quizzes:** Many sections will begin with a brief quiz (see course calendar for quiz dates). Each quiz is worth 10 points for a maximum of **60 POINTS** for all quizzes. Quizzes cover recent material, but never material introduced in a lecture given on the same day as a quiz.

**Exams:** There will be two in-class midterms plus a final exam. Exams are cumulative, but will focus mostly on recently covered topics. The exam schedule for Chem 31B is as follows:

- **Midterm 1:** Tuesday, July 30th 10 AM – 11:30 AM
- **Midterm 2:** Wednesday, August 7th 10 AM – 11:30 AM
- **Final Exam:** Thursday, August 15th 10 AM – 1 PM

*You must take all exams at the scheduled dates and times. Do not commit to courses or other activities that would make it impossible to do this.*

**Course Grade:** Your final course grade will be determined by whichever of the following two methods results in the higher overall score:

<table>
<thead>
<tr>
<th></th>
<th>Method 1</th>
<th>Method 2</th>
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<tbody>
<tr>
<td>Daily Work (Mastering Chemistry, iClickers, Sections, Quizzes)</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>Midterm 1 &amp; Midterm 2</td>
<td>35%</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
<td>55%</td>
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Course Policies

Graded Work: Graded work will be returned to you in section by your TA.

Attendance: You cannot enroll in classes or other activities that conflict with any of the exams, the lectures, or your assigned sections. Requests for alternate arrangements for specific assignments must be for approved University reasons and must be requested from your TA as soon as possible, but at least one week in advance.

If you must miss class due to serious illness, family crisis, or other exceptional extenuating circumstances, contact your TA as soon as possible. In the case of an excused absence, accommodations will be made for you to make-up daily work. You are responsible for learning any material that you missed. No make-up exams will be given. If your absence is excused, the final exam will count in place of the missing exam.

Late Assignments: Late assignments are not accepted. Exceptions to this policy are rare and require exceptional, extenuating circumstances. Contact your TA if this might apply to you.

Exam Regrades: Regrade requests must be submitted in person to your TA at lecture or section no later than 48 hours after the assignment is returned. The original, unaltered exam must be accompanied by a typed cover letter clearly explaining why the work merited more points. Only answers written in ink can be regraded. Please note that when an exam is submitted for regrade, your TA and/or the instructor will reevaluate the entire exam, not just the problems requested. This can result in either a net gain or loss of points. Copies of graded exams are kept on file to monitor both grading consistency and Honor Code violations.

Students with Disabilities: Students who may need academic accommodation due to disability must initiate the request with the Student Disability Resource Center (SDRC) located within the Office of Accessible Education (OAE). SDRC staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an accommodation letter for faculty dated in the current quarter in which the request is being made. Students should contact the SDRC as soon as possible since timely notice is needed to coordinate accommodations. The OAE is located at 563 Salvatierra Walk (phone: 723-1066).
<table>
<thead>
<tr>
<th></th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
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<tbody>
<tr>
<td>22</td>
<td>LECTURE 1: Intro to Chem 31B + Intermolecular Forces &amp; Graphical Depictions of Phase Change (Ch. 11)</td>
<td>LECTURE 2: Phase Changes (Ch. 11) + Kinetics &amp; Rate Laws (Ch. 12)</td>
<td>LECTURE 3: Reaction Mechanism, Integrated Rate Laws, and the Impact of Temperature and Catalysts on Reaction Rates (Ch. 12)</td>
<td>LECTURE 4: Equilibrium, Kc vs. Qc, ICE Tables, and Le Chatelier’s Principle (Ch. 13)</td>
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<tr>
<td>23</td>
<td>12:00 PM - 1:15 PM</td>
<td>LUNCH</td>
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<tr>
<td>24</td>
<td>1:15 PM - 3:00 PM</td>
<td>-</td>
<td>SECTION 1: Kinetics + QUIZ</td>
<td>SECTION 2: Equilibria + QUIZ</td>
</tr>
<tr>
<td>25</td>
<td>3:00 PM - 4:30 PM</td>
<td>OFFICE HOURS</td>
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**NOTES**

HW #1 (due by 9am Tuesday)  
HW #2 (due by 9am Wednesday)  
HW #3 (due by 9am Thursday)  
HW #4 (due by 9am Friday)

End of Chapter Problems (as needed):

Ch. 11: 1-7, 11-15, 37-41 odds  
Ch. 12: 1-29 odds  
Ch. 13: 1-49 odds

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| 29 | 10:00 AM - 12:00 PM         | MIDTERM 1 (Ch. 11-13)       | LECTURE 6: Acid/Base Titrations: SA/5B vs. WA/5B (Ch. 15) | LECTURE 7: Acid/Base Properties of Salts (Ch. 14) + Solubility & Precipitation (Ch. 15) |
| 30 | 12:00 PM - 1:15 PM          | LUNCH                       | LUNCH                      | LUNCH                       |
| 31 | 1:15 PM - 3:00 PM           | SECTION 3: Midterm 1 Review | SECTION 4: Acid/Base Chemistry | SECTION 5: Determination of a Solubility Equilibrium + QUIZ |
|     | 3:00 PM - 4:30 PM           | OFFICE HOURS                | OFFICE HOURS               | OFFICE HOURS                |

**NOTES**

Study for Midterm 1!  
HW #5 (due by 9am Wednesday)  
HW #6 (due by 9am Thursday)  
HW #7 (due by 9am Friday)

End of Chapter Problems (as needed):

Ch. 11-13 Cumulative Problems  
Ch. 14: 1-63, 79, 81 odds  
Ch. 15: 35-51 odds  
Ch. 15: 55-75 odds

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<tr>
<th>5</th>
<th>10:00 AM - 12:00 PM</th>
<th>LECTURE 8: Intro to Buffers + Calculating Solution pH and pH Changes in Buffer Systems (Ch. 15)</th>
<th>LECTURE 9: In-Class Practice with Acid/Base, Precipitation, and Buffer Problems (Ch. 14 &amp; 15)</th>
<th>LECTURE 10: Entropy &amp; Gibbs Free Energy (Ch. 16)</th>
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<tr>
<td>6</td>
<td>12:00 PM - 1:15 PM</td>
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<tr>
<td>7</td>
<td>1:15 PM - 3:00 PM</td>
<td>SECTION 6: Buffers + QUIZ</td>
<td>SECTION 7: Midterm 2 Review</td>
<td>SECTION 8: Entropy</td>
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<tr>
<td>8</td>
<td>3:00 PM - 4:30 PM</td>
<td>OFFICE HOURS</td>
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**NOTES**

HW #8 (due by 9am Tuesday)  
Study for Midterm 2!  
HW #9 (due by 9am Friday)

End of Chapter Problems (as needed):

Ch. 15: 1-33 odds  
Ch. 14-15 Cumulative Problems  
Ch. 16: 1-45 odds

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<thead>
<tr>
<th>12</th>
<th>10:00 AM - 12:00 PM</th>
<th>LECTURE 11: Redox Reactions, Voltaic Cells, and Batteries (Ch. 17)</th>
<th>LECTURE 12: Spontaneity (AG, Ecell, and K), Electrolytic Cells, and Plating Cells (Ch. 17)</th>
<th>FINAL EXAM REVIEW</th>
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<tr>
<td>13</td>
<td>12:00 PM - 1:15 PM</td>
<td>LUNCH</td>
<td>LUNCH</td>
<td>LUNCH</td>
</tr>
<tr>
<td>14</td>
<td>1:15 PM - 3:00 PM</td>
<td>SECTION 9: Redox Reactions &amp; Voltaic Cells + QUIZ</td>
<td>SECTION 10: Electrolytic Cells &amp; Electrolysis of Water + QUIZ</td>
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</tr>
<tr>
<td>15</td>
<td>3:00 PM - 4:30 PM</td>
<td>OFFICE HOURS</td>
<td>OFFICE HOURS</td>
<td>OFFICE HOURS</td>
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**NOTES**

HW #10 (due by 9am Tuesday)  
HW #11 (due by 9am Wednesday)  
Study for Final Exam!  
HW #12 (due by 9am Friday)

End of Chapter Problems (as needed):

Ch. 17: 1-15 odds  
Ch. 17: 17-45, 53-59 odds  
Ch. 16-17 Cumulative Problems  
Ch. 17-115 Material  
Ch. 16-17 Cumulative Problems  
Ch. 17-115 Material

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**SUMMER 2013 | CHEM 31B CALENDAR | CARDIN**