Principles of General Chemistry II
Chemistry 212, Winter 2014

Dr. Miriam Buschhaus
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661-654-2674
Office: DDH BB214 in the overhead walkway between DDH and SCI I
Lecture: TuTh 8:10 am – 9:50 am
January 6th – March 20th
Room: Sci III 108
Office hours: Mo 11:00 am – noon, TuWe 10:00 am – 11:00 am, Th 10:00 am – noon, Friday only by prior appointment

Co-requisite Laboratory Course
Students must take the CHEM 212L laboratory course at the same time as this lecture course, unless CHEM 212L has already been completed with a satisfactory grade.

Required Materials:
- iClicker remote
- ALEKS subscription
- Scientific calculator (no programmable calculators allowed)
- Scantron Form 30423 (need three Scantron Forms in total, one for each exam)

General Topic Schedule
This course covers eight topic areas:
1. Chemical Reactions
2. Solutions
3. Chemical Equilibrium
   - First midterm exam: Topic areas 1–3.
4. Acids and Bases
5. Acid-Base Equilibria
6. Solubility and Complex-Ion Equilibria
   - Second midterm exam: Topic areas 4 – 6.
7. Thermochemistry
8. Thermodynamics and Equilibrium
   - FINAL EXAM: comprehensive. Covers all topics.

Course Description and Objectives
Chemistry blends knowledge (concepts and theories) with practical application (problem-solving). Therefore, by the end of the course the student will comprehend key concepts and apply them to solving typical problems in the following areas.
- Various aqueous chemical reactions, including
  - precipitation reactions
  - acid-base chemistry
  - oxidation-reduction reactions
- Solutions, concentration, and properties of solutions.
- Dynamic equilibrium
  - Equilibrium constant and equilibrium concentrations.
  - Le Châtelier’s principle and equilibrium shift.
- Acids and bases:
• Arrhenius, Brønsted-Lowry and Lewis definitions.
• Strength, structure, and pH.
• Equilibrium involving weak acids and weak bases.
• Buffers and titration curves.
• Precipitation and solubility equilibria
  o Solubility product constant and related calculations.
• Thermochemistry and thermodynamics
  o Energy, heat of reaction, enthalpy
  o Hess’s Law, standard enthalpies of formation.
  o First, Second and Third laws of thermodynamics – enthalpy and spontaneous processes.
  o Free energy.

Grading
The overall grade for this course is based on performance in the online homework system (ALEKS), on in-class iClicker responses, and on examinations (midterms and final). Each category will be weighted as shown in the table below.

A weighted percent will be used to determine the final course grade. The grading option will be A, B, C, D, or F (+/- grading is at the instructor’s discretion). Final letter grades will be assigned following the standard 90-80-70% (of the total) grading scheme. If necessary, grades may be curved at the discretion of the instructor. A record of student grades will be posted on Blackboard and updated periodically throughout the quarter.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online homework: ALEKS</td>
<td>35 %</td>
</tr>
<tr>
<td>In-class and exams</td>
<td>65 %</td>
</tr>
<tr>
<td>In-class iClicker questions</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm exams</td>
<td>2 x 15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Overall total</td>
<td>100 %</td>
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</table>

It is the student’s responsibility to keep track of due dates announced in class, on the syllabus and on-line in Blackboard, and to get notes from another student for any missed class time. There is no make-up for iClicker questions or for exams.

In general a student should study at least TWO hours outside of class for every hour in class per week. For this 4 credit, ten-week course, this means study and preparation outside of class amounts to at least 8 hours per week and possibly more for some students.

Add/Drop: It is the responsibility of the student to take the necessary steps to add and drop the class by the university deadlines. The drop deadline is January 27th. After this, a student may withdraw (W) for serious and compelling reasons until February 24th.

Attitude: This course is designed to develop a student’s critical thinking skills with regards to chemical processes. Expanding one’s critical thinking skills is a difficult task. Regular lecture attendance is highly encouraged, as is reading the textbook chapters each week. The best path to success is through working out problems (as in ALEKS), not just trying to memorizing facts. The textbook, homework problems (ALEKS) and laboratory problems are like the questions on the examinations. Learn to think like a problem-solver. Be an active learner, and participate in lecture, laboratory and office hours. Ask for help if necessary. Knowledge does not diffuse from the book to the mind without effort.

Blackboard
Students must self-register on Blackboard using the provided class code (212). In addition to grades, the syllabus and weekly lecture notes will be made available for download through the Blackboard interface. Practice questions for midterm exams and review material will be available. Instructor announcements may be posted, and peer discussion forums are provided.
Lecture times will generally consist of PowerPoint lectures with embedded iClicker questions. Please see the CHEM 212 course schedule posted on Blackboard for specific details of content and important due dates.

**iClicker Questions**

iClicker remotes must be purchased or reused from a previous class. Students will register their iClicker remote during lecture under the guidance of the professor. “Clicker” questions are used in every lecture and points are received for both participation and correct answers using the iClicker remote. A student who earns at least 75% of the possible points will receive full credit in the iClicker grade category. No make-up clicker questions are available.

**Exams**

Midterm exams are planned for Tuesday, January 28th, and Tuesday, February 25th. Exam questions will reflect material covered in lecture, in the ALEKS concepts and in the textbook. A cumulative final examination is planned for Thursday, March 20th, 2014 (11:00 am – 1:30 pm). The date, time and location for the final exam will be confirmed later.

Students with any exam conflict must talk to the professor beforehand to make alternate arrangements; late tests will not be administered. If a student misses a test, it is that student’s responsibility to provide a doctor’s note or other documentation of a legitimate reason.

With advanced notice, accommodations are made for students with disabilities through the SSD office (654-3360, http://www.csub.edu/UnivServices/SSD/). Any students with disabilities requiring modification of seating, testing or other class procedures are requested to speak to the professor about this as soon as possible, either after class or during office hours.

**ALEKS**

The online homework system is called ALEKS (Assessment and Learning in Knowledge Spaces). To register individual ALEKS accounts visit http://www.aleks.com and use the following class code to enroll: MWNRR-M3EVM. ALEKS may be paid for in one of two ways: by purchasing a subscription through the Runner Bookstore (recommended for students with financial aid) or by direct enrollment online with the use of a credit card (recommended as the cheaper option). Students that are unable to pay within the first week should contact the instructor immediately to receive alternate instructions.

There are nine goals in ALEKS. Each goal consists of a mandatory scheduled assessment and a preset number of concepts that must be completed, usually within a one week timeframe. Each goal will be graded as a percentage, and the average of the nine weekly goals will count for 60% of the ALEKS grade. The other 40% of the ALEKS grade will be calculated based on the overall percentage of the pie completed by March 17th, 11:59 pm, the last day of classes.

A missed assessment, representing no work on ALEKS for an entire week, will result in a score of zero for that week. Each weekly grade is calculated from the number of concepts completed by the deadline, not on assessment scores. Be aware that an assessment done well may fill in more of the “pie”, but an assessment done poorly will remove some completed concepts from the pie, and a student will have to repeat those concepts in order to learn the material and meet the new weekly goal. ALEKS requires consistent, regular work throughout the quarter. Much of the out-of-class time will be spent completing the 180 ALEKS concepts.

The “Review” tab in ALEKS will let students practice topics already completed in the pie without any negative impact either on the pie or on assessments. Reviewing recent topics before a scheduled assessment may help obtain a better assessment performance. Also, creating a designated ALEKS notebook with notes about each concept is extremely helpful for review and Assessment success.
Please observe the following ALEKS schedule closely.

<table>
<thead>
<tr>
<th>Bonus</th>
<th>Jan 6 (12:00 am) – Jan 12 (11:59 pm)</th>
<th>Initial assessment, 36/180 concepts (20% pie)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1</td>
<td>Jan 6 (12:00 am) – Jan 19 (11:59 pm)</td>
<td>72/180 concepts (40% pie)</td>
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<tr>
<td>Goal 2</td>
<td>Jan 20 (12:00 am) – Jan 26 (11:59 pm)</td>
<td>Assessment 2, 86/180 concepts (48% pie)</td>
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<tr>
<td>Goal 3</td>
<td>Jan 27 (12:00 am) – Feb 2 (11:59 pm)</td>
<td>Assessment 3, 100/180 concepts (56% pie)</td>
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<tr>
<td>Goal 4</td>
<td>Feb 3 (12:00 am) – Feb 9 (11:59 pm)</td>
<td>Assessment 4, 114/180 concepts (63% pie)</td>
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<tr>
<td>Goal 5</td>
<td>Feb 10 (12:00 am) – Feb 16 (11:59 pm)</td>
<td>Assessment 5, 128/180 concepts (71% pie)</td>
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<tr>
<td>Goal 6</td>
<td>Feb 17 (12:00 am) – Feb 23 (11:59 pm)</td>
<td>Assessment 6, 142/180 concepts (79% pie)</td>
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<tr>
<td>Goal 7</td>
<td>Feb 24 (12:00 am) – Mar 2 (11:59 pm)</td>
<td>Assessment 7, 156/180 concepts (87% pie)</td>
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<tr>
<td>Goal 8</td>
<td>Mar 3 (12:00 am) – Mar 9 (11:59 pm)</td>
<td>Assessment 8, 168/180 concepts (93% pie)</td>
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<tr>
<td>Goal 9</td>
<td>Mar 10 (12:00 am) – Mar 17 (11:59 pm)</td>
<td>Assessment 9, 180/180 concepts (100% pie)</td>
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How to understand the table: Bonus, Goal 1 and Goal 2 as examples

A student begins working on ALEKS any time after January 6 at 12:00 am, starting with the Initial assessment, and progressing to work on individual concepts in the pie. If an Initial assessment does not begin after joining the class on ALEKS, contact the instructor immediately for further instructions.

**Bonus** – finishing the **Initial assessment** and reaching at least 36 concepts in the pie by Sunday January 12 at 11:59 pm will result in a bonus of +50% that will be added to the Goal 1 score.

**Goal 1** – the **Initial assessment** and 72 concepts in the pie must be completed by Sunday, January 19. (If the bonus has already been reached, continue working in the pie to get at least 72 concepts.)

**Goal 2** – this officially begins one minute after Goal 1 ends. In reality, a student begins Goal 2 at the next log-in, starting with **Assessment 2** and progressing to work in the pie to meet the 86 concept target by January 26 (11:59 pm). The other weeks follow a similar model, beginning with an assessment and then working on the pie concepts to meet the goal. (Remember that *every* assessment must be completed, otherwise the score for the week will be a zero.)

There are **two very important ALEKS deadlines** students must be aware of:

1. Students must **sign up** for ALEKS no later than the end of the first week. Anyone who has not signed up by **Friday January 10th** will be administratively dropped from CHEM 212 after the first week of classes.

2. After signing up for ALEKS, students must take the initial assessment and start working on the first module assigned. Any student who has not taken the initial assessment and is not actively using ALEKS by **Sunday January 19th** will be administratively dropped from CHEM 212 after the second week of classes.

**Any student who needs assistance** signing up for ALEKS or working on ALEKS problems should contact the instructor or go to the SCI II 176 computer lab. This lab will have a chemistry tutor present throughout the quarter (the times will be announced separately) who is specifically available help students with ALEKS.

**Professors will continue to monitor student progress in ALEKS** – if a student is not active in ALEKS or is not making satisfactory progress, that student will be contacted in specific intervention and will be required to attend the ALEKS computer lab times until sufficient progress is made. A refusal to respond to intervention will trigger further actions, up to and including assignment of a WU grade.

**Campus Policy on Academic Dishonesty**

The principles of truth and honesty are recognized as fundamental to a community of teachers and scholars. The University expects that students will honor these principles and in so doing will protect the integrity of all academic work and grades. Students are expected to do all work assigned to them without unauthorized assistance and not to give unauthorized assistance.

There are certain forms of conduct that violate this community's principles. **Academic dishonesty** is a broad category of actions that use fraud and deception to improve a grade or obtain course credit. Academic dishonesty arises whenever students attempt to gain an unearned academic advantage.
Plagiarism is a specific form of academic dishonesty which consists of the misuse of any works of another by claiming them as one's own. It may consist of using ideas, paragraphs, sentences, or phrases written by another, or using data or statistics compiled by another without giving citation. Other examples of academic dishonesty include falsification of data and the submission of essentially the same assignment for credit in two courses without prior approval.

A student who sends an iClicker remote to class with another student to gain credit for Clicker questions without attending that class commits academic dishonesty. A student who agrees to take another student’s iClicker to class also commits academic dishonesty.

Any student who asks another person to do any part of the ALEKS assessments or pie concepts commits academic dishonesty. Working on behalf of another person in ALEKS is also academic dishonesty. Using the textbook, lecture notes, and/or personal notes based on previous ALEKS questions to answer ALEKS questions in assessment or pie mode is NOT academic dishonesty; it is allowed and encouraged. Asking for help (instructor or another student) on an individual question until the student is able to do it alone is allowed and encouraged. Asking another person to simply answer the question is not permitted.

When a faculty member discovers a violation of the university’s policy of academic integrity, the faculty member is required to notify the CSUB student conduct coordinator. A course grade of ‘F’ may be assigned by the instructor. Additional sanctions, such as expulsion from the university, may be applied by the student conduct coordinator after meeting with the student. Please see the current catalog for more details.