Chem. 1110 (Spring 2013)

Instructor: Dr. Scott Russell
Course website: blackboard.csustan.edu
Office: N-365
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Lecture Schedule: MWF 10:00 am- 10:50 am in C-102
Office Hours*: MWF 9:00 am – 9:50 am & F 11:00 am – 11:50 pm in N-365
Time in “The Commons”: T 1:00 pm – 1:50 pm in N-124

*Appointments outside of these times may be requested via email.

Catalog Description.
A continuation of CHEM 1100, emphasizing gaseous and ionic equilibria, electrochemical principles, thermodynamics, radio-chemistry, and descriptive chemistry of the elements.
Corequisite: CHEM 1112 (lab) unless already completed with a CR or a grade of C- or higher.
Prerequisite: CHEM 1100 and 1102 with CR or grades of C- or higher. (Lecture, 3 hours; discussion, 1 hour)

Required Materials.
• Scientific calculator
• Scantron 882-E
• iclicker

Grades. The final grades are determined at the end of the course from the class weighted average percent. Final percentages are based on 3 significant figures and borderline scores will be rounded. Letter grades will be assigned as follows A (90% - 100%), B (80% - 90%), C (70% - 80%), D (60% - 70%), F (less than 60%). If CR/NC is selected prior to the census date, a grade of C- or better is required for credit. The instructor may use +/- letter grading if necessary.

The final grade for the course is based on the following categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent of total grade</th>
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<tbody>
<tr>
<td>Midterms</td>
<td>45%</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Discussion</td>
<td>15%</td>
</tr>
<tr>
<td>Online Homework</td>
<td>10%</td>
</tr>
<tr>
<td>In class questions (iclicker)</td>
<td>10%</td>
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</tbody>
</table>

The total grade percentage for the course is calculated as a weighted sum of the categories listed above with the following equation.

Total Grade Percentage = 0.45(% Earned on midterms) + 0.20(% Earned on Cumulative Final) + 0.15(% Earned in Discussion) + 0.10(% Earned in Online HW) + 0.10(% Earned on in class iclicker questions)
Midterms.
Four midterm exams will be given, which will reflect material covered in lecture, recommended textbook problems, and online homework. The format of the midterm exams will be a combination of multiple choice questions and workout problems.

Makeup Midterms.
Makeup midterm exams will not be given. However, your lowest midterm exam score will be dropped.

Final Exam.
The final exam covers both semesters of General Chemistry (CHEM 1100 and CHEM 1110). The final exam is written by the American Chemical Society (ACS). The cumulative final examination is scheduled for Friday, May 24th, from 8:30 a.m.-10:30 a.m. in C-102.

Online Homework.
Online homework will be assigned for each chapter covered in lecture. The students must complete the online homework from each chapter by the assigned due dates to receive credit. Students may attempt the questions an unlimited number of times until they get the answers correct. Students will be able to login to the online homework assignments through their blackboard accounts.

In-class questions (iclickers)
Questions will be posed to the class at the beginning of some lectures that cover concepts from previous lectures. Students will respond using iclickers and will receive credit for each submission and credit for each correct answer. Students must purchase their iclicker from the bookstore and register it at “www.iclicker.com/registration”. It is the responsibility of each student to bring their iclicker to each class. No makeup iclicker quizzes will be given. However, the lowest clicker quiz score will be dropped.

Recommended Textbook Problems.
Problems found throughout the text, and at the end of each chapter will be posted online. These problems will not be collected or graded, but are strongly recommended in order to master the material presented in lecture.

Academic Integrity.
Any cheating on examinations, quizzes, or homework is a serious offense. Any instance of cheating justifies a failing course grade. Copying answers and/or using unauthorized notes during quizzes and/or exams are regarded as cheating and will not be tolerated. The instructor reserves the right to remove any person suspected of cheating from the lecture room.
Adding.
It is the responsibility of the student to take the necessary steps to add the class by the university deadlines. The add deadline is Friday, February 8, 2013.

Dropping.
It is the responsibility of the student to take the necessary steps to drop the class by the university deadlines. The drop deadline is Friday, February 22, 2013.

CR/NC.
Friday, February 22, 2013 is the last day to change the grading option to credit/no credit. Any course grade lower than a C- will receive no credit.

Tutoring Center.
The center is located in library building room 112. These services are provided free of charge for any CSU Stanislaus student but are provided on a “first come, first served” basis. It is advisable to not put off getting help when you need additional support for this class.

Disability Resource Services (DRS).
The DRS office is situated in the Mary Stuart Rodgers Building (MSR) room 210. Any requests for special test taking situations must have prior approval from the DRS office. Additional information can be found at www.csustan.edu/DRS

General Education Goals (reprinted from the CSU Stanislaus catalog)

- To provide students with a comprehensive overview of the disciplines' basic principles, methodologies and perspectives.
- To introduce students to the disciplines' subject matter.
- To introduce students to cultural diversity as appropriate to the subject matter.
- To demonstrate to students a discipline's interrelationships with other disciplines.
- To require students to demonstrate clear communication and logical thinking skills.
Learning Objectives.

Chapter 10. Polar covalent bonds, dipole moments, intermolecular forces, liquid properties, phase changes, vapor pressure, boiling point, solid properties and structures (ionic & covalent), unit cells and crystalline solids.

Chapter 11. Solutions, energy changes and the solution process, concentration units, solubility factors, colligative properties, vapor pressure depression: Raoult’s law, boiling point elevation and freezing point depression, osmosis and osmotic pressure.

Chapter 12. Reaction rates, rate laws, reaction order, integrated rate laws, half life, zero, first, and second order reactions, reaction mechanisms, elementary reaction rate laws, overall reaction rate laws, reaction rate dependence on temperature: The Arrhenius equation, catalysis (homogeneous and heterogeneous)

Chapter 13. Chemical equilibrium, equilibrium constants, heterogeneous equilibria, Le Chatelier’s Principle, Shifting equilibria: Pressure, concentration, and temperature, catalysts, Linking equilibrium to chemical kinetics


Chapter 15. Neutralization reactions, the common-ion effect, buffer solutions, Henderson-Hasselbach equation, titration curves, solubility equilibrium, qualitative analysis.

Chapter 16. Thermodynamics, spontaneous processes, enthalpy, entropy, the second law of thermodynamics, free energy, chemical equilibria and free energy.

Chapter 17. Electrochemistry, galvanic cells, shorthand for galvanic cells, cell potentials and free energy, standard reduction potentials, Nernst Equation, batteries, fuel cells, corrosion, electrolysis, quantitative applications.

Chapter 22. Nuclear reactions, radioactivity, rates of radioactive decay, nuclear stability, nuclear energy, fission and fusion, biological effects and applications of nuclear chemistry.
Suggestions for success in this class

- Success in Chem. 1110 depends on you keeping up with the material.
- It is essential that you break the work up into pieces by doing a little each day.
- The material builds on itself and missing the foundation makes building the house very difficult.
- Cramming the material prior to exams only leads to stress and not success.
- By doing a little each day, you will quickly identify areas of difficulty.
- Seek out help as soon as possible, either in office hours or in your discussion section.

Success in Chem. 1110: Divide and Conquer

Read chapters  →  Attend lectures  ←  Do problems

Come with questions

Office Hours  ←  Discussion

Success on exams and quizzes
# Lecture and Exam Schedule*

<table>
<thead>
<tr>
<th>Dates</th>
<th>Chapter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/28, 1/30, 2/1, 2/4</td>
<td>Chapter 10</td>
<td>Liquids, solids, and phase changes</td>
</tr>
<tr>
<td>2/6, 2/8, 2/11, 2/13, 2/15</td>
<td>Chapter 11</td>
<td>Solutions and their properties</td>
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<tr>
<td>2/18</td>
<td>Midterm 1</td>
<td>Covers Chapters 10 &amp; 11</td>
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<tr>
<td>3/27, 3/29, 4/8, 4/10</td>
<td>Chapter 15</td>
<td>Applications of Aqueous Equilibria</td>
</tr>
<tr>
<td>4/12</td>
<td>Midterm 3</td>
<td>Covers Chapters 14 &amp; 15</td>
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<tr>
<td>4/24, 4/26, 4/29</td>
<td>Chapter 17</td>
<td>Electrochemistry</td>
</tr>
<tr>
<td>5/1, 5/3, 5/6</td>
<td>Chapter 22</td>
<td>Nuclear Chemistry</td>
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<tr>
<td>5/8</td>
<td>Midterm 4</td>
<td>Covers Chapters 16, 17 &amp; 22</td>
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<tr>
<td>5/10, 5/13, 5/15, 5/17</td>
<td>Review for final exam</td>
<td></td>
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<tr>
<td>5/24</td>
<td>ACS Standardized Cumulative Final Exam</td>
<td>Covers Entire Year (Chem. 1100 &amp; 1110)</td>
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*All dates are subject to change at the discretion of the instructor.