CH 123 - *GENERAL CHEMISTRY
Summer 2020 Syllabus, Section 400, CRN 71450
Credit hours: 5

Instructor Information
Paula Weiss
Rachelle Smith
Clara Wheeler

Session
8\17 to 9\4

Course Description
A general chemistry sequence intended for majors in fields other than the physical sciences. (CH 122 and CH 123 are Bacc Core courses.) Lec/rec/lab.

Course Credits
This course combines approximately 150 hours of instruction, online activities, and assignments for 5 credits.

Course Learning Outcomes
Competently discuss concepts and solve problems relating to: acid/base equilibria, buffers, acid/base titrations, solubility equilibria, principles of entropy and thermodynamics, electrochemistry, and nuclear chemistry.

Recognize and apply concepts and theories of basic physical or biological sciences.

Apply scientific methodology and demonstrate the ability to draw conclusions based on observation, analysis, and synthesis.

Demonstrate connections with other subject areas.

Communication
Please post all course-related questions in the Q&A Discussion Forum so that the whole class may benefit from our conversation. Please contact me privately for matters of a personal nature. I will reply to course-related questions within 24-48 hours. I will strive to return your assignments and grades for course activities to you within about five days of the due date.

Evaluation of Student Performance
Quizzes (15.18%)
Introductory Quiz 10 points
This quiz covers material in the Syllabus as well as in the Start Here, Course Information, and Proctoring Information modules.

CH123 Pre-Assessment 10 points
This pre-quiz consists of questions which are drawn from material in each chapter that is covered in CH123 and is designed to measure student understanding of the material prior to the start of the course.

Chapter 14 - Parts 1 & 2 Quiz 12 points
This quiz is over material in Parts 1 and 2 in Chapter 14. It covers sections 14.1, 14.2, 14.5, & subsections of 14.3

Chapter 14 - Parts 3 & 4 Quiz 12 points
This quiz is over material in Parts 3 and 4 in Chapter 14. It covers sections 14.6, 14.7, and the remaining subsections of 14.3

Chapter 15 Quiz 8 points
This quiz is over material in Chapter 15. It covers material in section 15.1.

Chapter 12 Quiz 12 points
This quiz is over material in Chapter 12.

Chapter 16 Quiz 12 points
This quiz is over material in Chapter 16. It covers sections 16.1-16.4, & 16.7

Chapter 20 Quiz 9 points
This quiz is over material in Chapter 20. It covers sections 20.1-20.4

Labs (13.39%)
Lab 1 - Lab Techniques 5 points
This lab is an introduction to the online lab site and will familiarize students with how instrumentation in the labs works and how experiments are designed.

Lab 2 - Titration I 10 points
In this lab, students will use titrations to determine the concentration of acid and base solutions.

To complete this lab, please go to the Modules page and access the the Online Chem Labs link in the Online Labs module. Completing the lab at the labs site is sufficient - there is no separate submission step. Please note that your score on the lab will not update in the Canvas gradebook until after the due date for the lab.

Lab 3 - Titration II 10 points
In this lab, students will use titration to determine the molar mass and $K_a$ of an unknown weak acid.

Lab 4 - Weak Acid Equilibrium 10 points
In this lab, students will investigate the buffering properties of different solutions

Lab 5 - Potentiometry 10 points
In this lab students will evaluate the electrochemical potential of different combinations of half-cells, and determine the concentration of ion in a non-standard solution based on the cell potential.

Lab 6 - Electroplating 10 points
In this lab students will investigate electroplating, and use the mass plated under known conditions of current and time to identify an unknown metal ion solution.

Lab 7 - Entropy 10 points
In this lab, students will use electrochemical measurements taken at different temperatures to determine thermodynamic parameters of an oxidation-reduction reaction.
Lab 8 - Nuclear Chemistry 10 points
In this lab, students will measure rates of radioactive decay and calculate the half life of isotopes.

Homework Totals (17.86%)
Chapter 14 - Part 1 Homework 10 points
This assignment consists of the following homework segments:
- Bronsted-Lowry Acids and Bases (1.5 pts)
- Acid-Base Properties of Water (2.5 pts)
- Acids and Bases: Conjugate Acids... (1.5 pts)
- pH and pOH (3 pts)
- pH and pOH: Solution Identification
These can all be accessed directly from the Chapter 14 - Parts 1 and 2 module.

Chapter 14 - Part 2 Homework 12.5 points
This assignment consists of the following homework segments:
- pH Calculations: Strong Acid (2 pts)
- pH Calculations: Weak Acid (3 pts)
- pH Calculations: Strong Base (2.5 pts)
- pH Calculations: Weak Base (2.5 pts)
- Molecular Structure and Acid-Base Strength (1 pt)
- Polyprotic Acids (1.5 pts)
These can all be accessed directly from the Chapter 14 - Parts 1 and 2 module.

Chapter 14 - Part 3 Homework 8.5 points
This assignment consists of the following homework segments:
- Conjugate Acids & Bases: Ka and Kb (1.5 pts)
- Acid and Base Strengths: Ka and Kb (3 pts)
- Ka and Kb Calculations (4 pts)
These can all be accessed directly from the Chapter 14 - Parts 3 and 4 module.

Chapter 14 - Part 4 Homework 9 points
This assignment consists of the following homework segments:
- Neutralization Reactions (1.5 pts)
- Buffers and Buffer Capacity (1.5 pts)
- Buffer Mixtures (1 pt)
- Buffer Calculations (2 pts)
- Acid Base Titrations (1 pt)
- Titration Calculations (2 pts)
These can all be accessed directly from the Chapter 14 - Parts 3 and 4 module.

Chapter 15 Homework 11 points
This assignment consists of the following homework segments:
- Dissolution (1 pt)
- Ksp and Molar Solubility (3 pts)
- Calculations with Ksp (3 pts)

• Common Ion Effect (1 pt)
• Precipitation (3 pts)

These can all be accessed directly from the Chapter 15 module.

Chapter 12 - Part 1 Homework 8 points
This assignment consists of the following homework segments:
- Spontaneity (2.5 pts)
- Entropy (3 pts)
- The 2nd and 3rd Laws of Thermodynamics (3 pts)
These can all be accessed directly from the Chapter 12 module.

Chapter 12 - Part 2 Homework 10 points
This assignment consists of the following homework segments:
- Free Energy Change (1 pt)
- Free Energy Change Calculations (3 pts)
- Free Energy: Temperature Effects (1.5 pts)
- Free Energy: Equilibrium Constant (4.5 pts)
These can all be accessed directly from the Chapter 12 module.

Chapter 16 - Part 1 Homework 10 points
This assignment consists of the following homework segments:
- Redox Reactions (1 pt)
- Balancing Acidic Redox Reactions (4 pts)
- Galvanic Cells and Cell Potential (1.5 pts)
- Standard Reduction Potentials (3.5 pt)
These can all be accessed directly from the Chapter 16 module.

Chapter 16 - Part 2 Homework 6.5 points
This assignment consists of the following homework segments:
- Relationship between Ecell, K, and deltaG (2.5 pts)
- The Nernst Equation (4 pts)
These can all be accessed directly from the Chapter 16 module.

Chapter 20 - Part 1 Homework 6 points
This assignment consists of the following homework segments:
- Nuclear Structure and Stability (2.5 pt)
- Nuclear Equations (3.5 pts)
These can all be accessed directly from the Chapter 20 module.

Chapter 20 - Part 2 Homework 8.5 points
This assignment consists of the following homework segments:
- Radioactive Decay (1.5 pt)
- Half-Lives (3.5 pts)
- Nuclear Fission and Nuclear Fusion (2.5 pts)
- Nuclear Binding Energy (1 pt)
These can all be accessed directly from the Chapter 20 module.
### Exams (53.57%)

**Midterm Exam Summer 2020 (Remotely Proctored)**  
100 points  
This exam is on the covered sections in Chapters 14 and 15.

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**Final Exam Summer 2020 (Remotely Proctored)**  
195 points  
This exam covers all of the material in the course, but is more heavily weighted toward the material that was not assessed on the midterm.

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### Extra Credit (1.78%)

**CH123: Class Introductions**  
3 points  
This extra credit discussion board post will help us get to know each other and build a course community.

**Week 1 Extra Credit**  
3 points  
This assignment will have students reflect on study strategies that will be useful for this course.

**Week 3 Extra Credit**  
3 points  
This assignment will have students reflect on the first quiz, and learn strategies for getting the most out of reviewing past assessments.

**Week 2 Extra Credit**  
3 points  
This assignment is to check in with students on their confidence in the course, and also make sure students are using calculators correctly.

**Week 4 Extra Credit**  
3 points  
This assignment will have students reflect on how they are preparing for the upcoming midterm exam in the course.

**Week 5 Extra Credit**  
3 points  
This assignment will have students reflect on strategies to manage exam anxiety, both before and during exams.

**Week 6 - Extra Credit - Midterm Exam Wrapper**  
3 points  
This assignment is designed to give students a chance to reflect on your exam performance and, more importantly, on the effectiveness of their exam preparation.

**Week 7 Extra Credit**  
3 points  
This assignment will have students reflect on situations when they have persevered and overcome obstacles.

**Week 8 Extra Credit**  
3 points  
This assignment will have students reflect on retrieval practice as a study strategy, and about how chemistry will be relevant to their chosen field of study.

**Week 9 Extra Credit**  
3 points  
This assignment asks students to reflect on how their study strategies have changed since the midterm exam.

**Week 10 Extra Credit**  
3 points  
For our final extra credit assignment, we're going to create a discussion board where people can discuss preparations for the final exam, and offer encouragement to each other.

### Schedule of Topics and Assignments

<table>
<thead>
<tr>
<th>Week of</th>
<th>Reading(s):</th>
<th>Agenda/Topic:</th>
<th>Due: (Pacific Time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/17</td>
<td>Ch. 14 (Pt. 1): Sections 14.1-14.2  Ch. 14 (Pt. 2): Subsections in section 14.3, section 14.5  Ch 14 (Pt. 3): Subsections in section 14.3  Ch 14 (Pt. 4): Sections 14.6-14.7</td>
<td>Acid Base Equilibria  *Register for Knewton Alta homework (through Canvas)  *Register for online labs site (through Canvas)  *Find an exam proctor &amp; sign-up through Ecampus Testing</td>
<td>Due 8/18 at 11:59pm:  Introductory Quiz (p. 1)  CH123 Pre-Assessment (p. 1)  Lab 1 - Lab Techniques (p. 1)  CH123: Class Introductions (p. 3)  Due 8/19 at 11:59pm:  Chapter 14 - Parts 1 2 Quiz (p. 1)  Chapter 14 - Part 1 Homework (p. 2)  Chapter 14 - Part 2 Homework (p. 2)  Due 8/20 at 11:59pm:  Week 1 Extra Credit (p. 3)  Due 8/21 at 11:59pm:  Chapter 14 - Parts 3 4 Quiz (p. 1)  Lab 2 - Titration I (p. 1)  Chapter 14 - Part 3 Homework (p. 2)  Chapter 14 - Part 4 Homework (p. 2)  Due 8/22 at 11:59pm:  Week 2 Extra Credit (p. 3)  Due 8/23 at 11:59pm:  Week 3 Extra Credit (p. 3)  Week 4 Extra Credit (p. 3)</td>
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8/24
Ch. 15: Section 15.1
Ch. 12 (Pt. 1): Sections 12.1-12.3
Ch. 12 (Pt. 2): Section 12.4
Equilibria of Other Reaction Classes
Thermodynamics
MIDTERM EXAM
Due 8/24 at 11:59pm:
Lab 3 - Titration II (p. 1)
Due 8/25 at 11:59pm:
Chapter 15 Quiz (p. 1)
Lab 4 - Weak Acid Equilibrium (p. 1)
Chapter 15 Homework (p. 2)
Due 8/26 at 10pm:
Midterm Exam Summer 2020 (Remotely Proctored) (p. 3)
Due 8/27 at 11:59pm:
Week 5 Extra Credit (p. 3)
Due 8/28 at 11:59pm:
Chapter 12 Quiz (p. 1)
Chapter 12 - Part 1 Homework (p. 2)
Due 8/29 at 11:59pm:
Week 6 - Extra Credit - Midterm Exam Wrapper (p. 3)
Week 7 Extra Credit (p. 3)

8/31
Ch. 16 (Pt. 1): Sections 16.1-16.3
Ch. 16 (Pt. 2): Sections 16.4, 16.7
Ch. 20: Sections 20.1-20.4
Electrochemistry
Nuclear Chemistry
FINAL EXAM
Due 8/31 at 11:59pm:
Week 8 Extra Credit (p. 3)
Week 9 Extra Credit (p. 3)
Due 9/1 at 11:59pm:
Chapter 16 Quiz (p. 1)
Chapter 16 - Part 1 Homework (p. 2)
Due 9/2 at 11:59pm:
Lab 5 - Potentiometry (p. 1)
Lab 6 - Electroplating (p. 1)
Lab 7 - Entropy (p. 1)
Week 10 Extra Credit (p. 3)
Due 9/3 at 11:59pm:
Chapter 20 Quiz (p. 1)
Lab 8 - Nuclear Chemistry (p. 2)
Chapter 20 - Part 1 Homework (p. 2)
Due 9/4 at 10pm:
Final Exam Summer 2020 (Remotely Proctored) (p. 3)

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent Range</th>
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<tbody>
<tr>
<td>A</td>
<td>92-100</td>
</tr>
<tr>
<td>A-</td>
<td>89-91</td>
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<tr>
<td>B+</td>
<td>86-88</td>
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<td>B</td>
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<td>60-61</td>
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<tr>
<td>F</td>
<td>&lt;60</td>
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Please Note
This syllabus is subject to change with notice from the instructor. For students registered in this section, there is additional content in the syllabus, which can be accessed through Canvas (http://oregonstate.instructure.com) at the start of term.