CH 123 - GENERAL CHEMISTRY  
Spring 2020 Syllabus, Section 400, CRN 52127
Credit hours: 5

Instructor Information  
Marita Barth

Session  
3\30 to 6\5

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 hours. I will strive to return your assignments and grades for course activities to you within five days of the due date.

Evaluation of Student Performance

Quizzes (15.18%)  
Introductory Quiz  
This quiz covers material in the Syllabus as well as in the Start Here, Course Information, and Proctoring Information modules. Please be sure you have reviewed these before attempting this quiz.

You may take this quiz as many times as necessary to earn full credit up until the due date/time. Please note that this is the ONLY quiz in this course that allows multiple attempts.

CH123 Pre-Quiz  
This pre-quiz consists of 15 questions which are drawn from material in each chapter that is covered in CH123. The questions in this pre-quiz are graded solely on completion, so please answer them to the best of your ability without referring to any course materials or attempting to look up.

Chapter 14 - Parts 1 & 2 Quiz  
This quiz is over material in Parts 1 and 2 in Chapter 14. You have one attempt, so please be sure that you're prepared before you take the quiz.

Chapter 14 - Parts 3 & 4 Quiz  
This quiz is over material in Parts 3 and 4 in Chapter 14. You have one attempt, so please be sure that you're prepared before you take the quiz.

Chapter 15 Quiz  
This quiz is over material in Chapter 15. You have one attempt, so please be sure that you're prepared before you take the quiz.

Chapter 12 Quiz  
This quiz is over material in Chapter 12. You have one attempt, so please be sure that you're prepared before you take the quiz.

Chapter 16 Quiz  
This quiz is over material in Chapter 16. You have one attempt, so please be sure that you're prepared before you take the quiz.

Chapter 20 Quiz  
This quiz is over material in Chapter 20. You have one attempt, so please be sure that you're prepared before you take the quiz.

Labs (13.39%)  
Lab 1 - Lab Techniques  
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 2 - Titration I  
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  
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 4 - Weak Acid Equilibrium  
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 5 - Potentiometry  
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 6 - Electroplating**
To complete this lab, please go to the Modules page and access 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 7 - Entropy**
To complete this lab, please go to the Modules page and access 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 8 - Nuclear Chemistry**
To complete this lab, please go to the Modules page and access 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.

**Homework Totals (17.86%)**

**Chapter 14 - Part 1 Homework**
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**
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**
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**
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**
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**
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**
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**
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**
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
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
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 Spring 2020
This exam consists of 25 questions worth 4 points each, and 1 extra credit question. You have 80 minutes (one hour and 20 minutes) to complete and submit the exam. The exam will autosubmit after 80 minutes.

Final Exam Spring 2020
This exam consists of 40 questions worth 5 points each, and 1 extra credit question. You have 110 minutes (one hour and fifty minutes) to complete and submit this exam. The exam will autosubmit at the end of this period.

Extra Credit (1.78%)

Midterm Exam Wrapper
This assignment is designed to give you a chance to reflect on your exam performance and, more importantly, on the effectiveness of your exam preparation. Please answer the questions sincerely.

Extra Credit Survey
This survey is graded based on completion and is worth five extra credit points. Survey answers are anonymous, so please answer honestly!

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>
</table>
| 3/30    | Ch. 14, Pt. 1: Sections 14.1-14.2 | Acid Base Equilibria  
*Register for Knewton Alta homework (through Canvas)  
*Register for online labs site (through Canvas)  
*Find an exam proctor & sign-up through Ecampus Testing | Due 4/3 at 11:59pm:  
Introductory Quiz (p. 1)  
CH123 Pre-Quiz (p. 1)  
Chapter 14 - Part 1 Homework (p. 2) |
| 4/6     | Ch. 14, Pt. 2: Subsections in section 14.3 (see study guide), section 14.5 | Acid Base Equilibria | Due 4/10 at 11:59pm:  
Chapter 14 - Parts 1 2 Quiz (p. 1)  
Lab 1 - Lab Techniques (p. 1)  
Chapter 14 - Part 2 Homework (p. 2) |
| 4/13    | Ch. 14, Pt. 3: Subsections in section 14.3 (see study guide)  
Begin Ch. 14, Pt. 4: Sections 14.6-14.7 | Acid Base Equilibria | Due 4/17 at 11:59pm:  
Chapter 14 - Part 3 Homework (p. 2) |
| 4/20    | Finish Ch. 14, Pt. 4: Sections 14.6-14.7  
Begin Ch. 15: Section 15.1 | Acid Base Equilibria  
Equilibria of Other Reaction Classes | Due 4/24 at 11:59pm:  
Chapter 14 - Parts 3 4 Quiz (p. 1)  
Lab 2 - Titration I (p. 1)  
Chapter 14 - Part 4 Homework (p. 2) |
| 4/27    | Finish Ch. 15: Section 15.1 | Equilibria of Other Reaction Classes | Due 5/1 at 11:59pm:  
Chapter 15 Quiz (p. 1)  
Lab 3 - Titration II (p. 1)  
Chapter 15 Homework (p. 2) |
| 5/4     | Ch. 12, Pt. 1: Sections 12.1-12.3  
Begin Ch. 12, Pt. 2: Section 12.4 | Thermodynamics  
MIDTERM EXAM | Due 5/6 at 11:30pm:  
Midterm Exam Spring 2020 (p. 3)  
Due 5/8 at 11:59pm:  
Lab 4 - Weak Acid Equilibrium (p. 1) |
| 5/11    | Finish Ch. 12, Pt. 2: Section 12.4  
Begin Ch. 16, Pt. 1: Sections 16.1-16.3 | Thermodynamics  
Electrochemistry | Due 5/15 at 11:59pm:  
Chapter 12 Quiz (p. 1)  
Lab 5 - Potentiometry (p. 1)  
Chapter 12 - Part 1 Homework (p. 2)  
Chapter 12 - Part 2 Homework (p. 2) |
<table>
<thead>
<tr>
<th>Date</th>
<th>Assignments</th>
<th>Due Dates</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/18</td>
<td>Finish Ch. 16, Pt. 1: Sections 16.1-16.3 Begin Ch. 16, Pt. 2: Sections 16.4, 16.7 Electrochemistry</td>
<td>Due 5/22 at 11:59pm: Lab 6 · Electroplating (p. 2) Midterm Exam Wrapper (p. 3)</td>
<td></td>
</tr>
<tr>
<td>5/25</td>
<td>Finish Ch. 16, Pt. 2: Sections 16.4, 16.7 Begin Ch. 20: Sections 20.1-20.4 Electrochemistry Nuclear Chemistry</td>
<td>Due 5/29 at 11:59pm: Chapter 16 Quiz (p. 1) Lab 7 · Entropy (p. 2) Chapter 16 · Part 1 Homework (p. 2) Chapter 16 · Part 2 Homework (p. 2)</td>
<td></td>
</tr>
<tr>
<td>6/1</td>
<td>Finish Ch. 20: Sections 20.1-20.4 Nuclear Chemistry</td>
<td>Due 6/2 at 8am: Extra Credit Survey (p. 3) Due 6/5 at 11:59pm: Chapter 20 Quiz (p. 1) Lab 8 · Nuclear Chemistry (p. 2) Chapter 20 · Part 1 Homework (p. 3) Chapter 20 · Part 2 Homework (p. 3)</td>
<td></td>
</tr>
<tr>
<td>6/8</td>
<td>FINAL EXAM</td>
<td>Due 6/10 at 11:50pm: Final Exam Spring 2020 (p. 3)</td>
<td></td>
</tr>
</tbody>
</table>

### Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92-100</td>
</tr>
<tr>
<td>A-</td>
<td>89-91</td>
</tr>
<tr>
<td>B+</td>
<td>86-88</td>
</tr>
<tr>
<td>B</td>
<td>82-85</td>
</tr>
<tr>
<td>B-</td>
<td>79-81</td>
</tr>
<tr>
<td>C+</td>
<td>76-78</td>
</tr>
<tr>
<td>C</td>
<td>72-75</td>
</tr>
<tr>
<td>C-</td>
<td>69-71</td>
</tr>
<tr>
<td>D+</td>
<td>66-68</td>
</tr>
<tr>
<td>D</td>
<td>62-65</td>
</tr>
<tr>
<td>D-</td>
<td>60-61</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60</td>
</tr>
</tbody>
</table>

### 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.