CH 122 - *GENERAL CHEMISTRY
Summer 2020 Syllabus, Section 400, CRN 71449
Credit hours: 5

Instructor Information
Marita Barth

Session
7/20 to 8/14

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

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
This quiz is over material in the Syllabus and in the Course Information module.

CH 122 Pre-Assessment
The pre-assessment is to measure how much of the course material students already know, and is graded based on completion.

Chapter 8 Quiz
This quiz is based on material in Chapter 8: Gases. Sections covered are 8.1-8.3, 8.5 & 8.6

Chapter 9 Quiz
This quiz is based on material in Chapter 9: Thermochemistry

Chapter 10 Quiz
This quiz is based on material in Chapter 10: Liquids and Solids. Sections covered are 10.1-10.4

Chapter 11 Quiz
This quiz is based on material in Chapter 11: Solutions and Colloids. Sections covered are 11.1, 11.3, and 11.4

Chapter 17 Quiz
This quiz is based on material in Chapter 17: Kinetics

Chapter 13 Quiz
This quiz is based on material in Chapter 13: Fundamental Equilibrium Concepts.

Labs (13.39%)
Lab 1 - Lab Techniques
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 - Linear Regression
This lab introduces students to the use of spreadsheets in analyzing data from scientific experiments.

Lab 3 - Metals and HCl
This lab has students use their knowledge of ideal gas laws and balancing chemical equations to identify an unknown metal after reaction with an acid.

Lab 4 - Calorimetry
In this lab, students will perform calorimetry experiments and identify an unknown substance based on its heat of combustion

Lab 5 - TLC Elution
In this lab, students will investigate intermolecular interactions based on the chromatographic elution of compounds in different solvents

Lab 6 - Freezing Point Depression
In this lab, students will investigate freezing point depression, and identify an unknown using this property.

Lab 7 - Osmotic Pressure
In this lab, students will investigate osmotic pressure, and identify an unknown compound based on this property.

Lab 8 - Iodine Clock
In this lab, students will investigate reaction kinetics and learn how to use data collected from their experiments to evaluate the kinetics of a reaction.

Homework Totals (17.86%)
Chapter 8 - Part 1 Homework
This assignment consists of the following homework segments:
  • Gas Pressure (1 pt)
  • The Kinetic Molecular Theory (2 pt)
These can all be accessed directly from the Chapter 8 module.

Chapter 8 - Part 2 Homework
This assignment consists of the following homework segments:
Gas Laws: Pressure, Temp, Volume (2 pt)
Gas Laws: Avogadro’s Law (2 pt)
Gas Laws: Ideal Gas Laws (3 pt)
These can all be accessed directly from the Chapter 8 module.

Chapter 8 - Part 3 Homework
This assignment consists of the following homework segments:

- Gas Law Calculations (1.5 pt)
- Density and Molar Mass of a Gas (2 pt)
- Non-Ideal Gas Behavior (1 pt)
- Gas Stoichiometry (2.5 pt)
- Partial Pressure Calculations (2.5 pt)
- Kinetic Molecular Theory and Gas Laws (1.5 pt)
These can all be accessed directly from the Chapter 8 module.

Chapter 9 - Part 1 Homework
This assignment consists of the following homework segments:

- Energy Basics (2 pt)
- Heat and Heat Capacity (3 pt)
- Heat Transfer and Calorimetry (3.5 pt)
These can all be accessed directly from the Chapter 9 module.

Chapter 9 - Part 2 Homework
This assignment consists of the following homework segments:

- Enthalpy (3 pt)
- Standard Enthalpies of Formation (2.5 pt)
- Covalent Bond (2.5 pt)
These can all be accessed directly from the Chapter 9 module.

Chapter 10 Homework
This assignment consists of the following homework segments:

- Intermolecular and Intramolecular Forces (1 pt)
- Types of Intermolecular Forces (2 pt)
- Phase Transitions: Introduction (1 pt)
- Phase Transitions: Vaporization (2 pt)
- Phase Transitions: Sublimation and Melting (1 pt)
- Phase Transitions: Heat/Cooling Curves (2 pt)
- Phase Transitions: Interpretations (1.5 pt)
These can all be accessed directly from the Chapter 10 module.

Chapter 11 - Part 1 Homework
This assignment consists of the following homework segments:

- The Solution Process (1.5 pt)
- General Solubility (1.5 pt)
- Colligative Properties (1 pt)
- Colligative Properties: Concentration Units (2 pt)
These can all be accessed directly from the Chapter 11 module.

Chapter 11 - Part 2 Homework
This assignment consists of the following homework segments:

- Colligative Properties: Vapor Pressure Lowering (2 pt)
- Colligative Properties: Boiling Point Elevation (2 pt)
- Colligative Properties: Freezing Point Depression (1.5 pt)
- Colligative Properties: Osmotic Pressure (1.5 pt)
These can all be accessed directly from the Chapter 11 module.

Chapter 17 - Part 1 Homework
This assignment consists of the following homework segments:

- Theories of Chemical Kinetics (1.5 pt)
- Chemical Reaction Rates (2 pt)
- Chemical Reaction Rates: Experimental Data (2 pt)
These can all be accessed directly from the Chapter 17 module.

Chapter 17 - Part 2 Homework
This assignment consists of the following homework segments:

- Factors Affecting Reaction Rates (2 pt)
- Rate Laws: Definition (2 pt)
- Rate Laws: Reaction Order and... (3 pt)
- Integrated Rate Laws: First Order... (2 pt)
- Reaction Mechanisms (2 pt)
- Catalysis (1.5 pt)
These can all be accessed directly from the Chapter 17 module.

Chapter 13 - Part 1 Homework
This assignment consists of the following homework segments:

- Chemical Equilibria (1.5 pt)
- Chemical Equilibria: Reaction Quotient (2 pt)
- Chemical Equilibria: Equilibrium Constants (2.5 pt)
- Chemical Equilibria: Homogenous &... (2 pt)
- Equil. Calc: Equilibrium Constants (2.5 pt)
These can all be accessed directly from the Chapter 13 module.

Chapter 13 - Part 2 Homework
This assignment consists of the following homework segments:

- Equil Calc: Equilibrium Concentrations: (3 pt)
- Equil Calc: Equilibrium Concentrations II: (3.5 pt)
- LeChatlier’s Principle: Conc. & Press. (2 pt)
These can all be accessed directly from the Chapter 13 module.

Exams (53.57%)
Midterm Exam (U20) (Remotely Proctored)
This exam covers material from Chapters 8, 9, and 10.
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Final Exam (U20) (Remotely Proctored)
This exam is comprehensive, and covers all of the material in the term, although it is more heavily weighted toward material that has not yet been assessed on an exam.

Extra Credit (4.29%)
Course Introductions
This extra credit discussion board post will help us get to know each other and build a course community.

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

Week 2 Extra Credit
This assignment will have students reflect on how they’re doing so far, and make sure they are using their calculators correctly.

Week 3 Extra Credit
This assignment is to check in with students on their confidence in the course, and also make sure students are using calculators correctly as we move into calculations that use scientific notation.

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

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

Week 6 - Extra Credit - Midterm Exam Wrapper
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
This assignment will have students reflect on situations when they have persevered and overcome obstacles.

Week 8 Extra Credit
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
This assignment asks students to reflect on how their study strategies have changed since the midterm exam.

Week 10 Extra Credit
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>
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<tbody>
<tr>
<td>7/20</td>
<td>Ch 8: Sections 8.1-8.3, 8.5-8.6</td>
<td>Gases  *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 7/21 at 11:59pm: Introductory Quiz (p. 1) CH 122 Pre-Assessment (p. 1) Lab 1 - Lab Techniques (p. 1) Chapter 8 - Part 1 Homework (p. 1) Course Introductions (p. 3) Due 7/23 at 11:59pm: Week 1 Extra Credit (p. 3) Due 7/24 at 11:59pm: Chapter 8 Quiz (p. 1) Lab 2 - Linear Regression (p. 1) Chapter 8 - Part 2 Homework (p. 1) Chapter 8 - Part 3 Homework (p. 2) Due 7/26 at 11:59pm: Week 2 Extra Credit (p. 3)</td>
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### Grading Scale

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<td>B</td>
<td>82-85</td>
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<tr>
<td>B-</td>
<td>79-81</td>
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### Week Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Section(s)</th>
<th>Topic(s)</th>
<th>Due Date(s)</th>
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</thead>
</table>
| 7/27  | Ch. 9: 9.1-9.4 | Thermochemistry, Liquids & Solids | Due 7/28 at 11:59pm:  
Chapter 9 Quiz (p. 1)  
Lab 3 - Metals and HCl (p. 1)  
Chapter 9 - Part 1 Homework (p. 2)  
Chapter 9 - Part 2 Homework (p. 2)  
Due 7/29 at 11:59pm:  
Week 3 Extra Credit (p. 3)  
Due 7/31 at 11:59pm:  
Chapter 10 Quiz (p. 1)  
Lab 4 - Calorimetry (p. 1)  
Lab 5 - TLC Elution (p. 1)  
Chapter 10 Homework (p. 2)  
Due 8/1 at 11:59pm:  
Week 4 Extra Credit (p. 3)  
Due 8/2 at 11:59pm:  
Week 5 Extra Credit (p. 3) |
| 8/3   | Ch. 11: 11.1-11.4 | MIDTERM EXAM, Physical Properties of Solutions, Kinetics | Due 8/3 at 10pm:  
Midterm Exam (U20) (Remotely Proctored) (p. 2)  
Due 8/3 at 11:59pm:  
Week 6 - Extra Credit - Midterm Exam Wrapper (p. 3)  
Due 8/4 at 11:59pm:  
Chapter 11 Quiz (p. 1)  
Lab 6 - Freezing Point Depression (p. 1)  
Chapter 11 - Part 1 Homework (p. 2)  
Chapter 11 - Part 2 Homework (p. 2)  
Due 8/5 at 11:59pm:  
Week 7 Extra Credit (p. 3)  
Due 8/7 at 11:59pm:  
Chapter 17 Quiz (p. 1)  
Lab 7 - Osmotic Pressure (p. 1)  
Chapter 17 - Part 1 Homework (p. 2)  
Chapter 17 - Part 2 Homework (p. 2)  
Due 8/8 at 11:59pm:  
Week 8 Extra Credit (p. 3)  
Due 8/9 at 11:59pm:  
Chapter 13 - Part 1 Homework (p. 2)  
Week 9 Extra Credit (p. 3) |
| 8/10  | Ch. 13: 13.1-13.4 | Chemical Equilibrium, FINAL EXAM | Due 8/10 at 11:59pm:  
Week 10 Extra Credit (p. 3)  
Due 8/11 at 11:59pm:  
Chapter 13 Quiz (p. 1)  
Lab 8 - Iodine Clock (p. 1)  
Chapter 13 - Part 2 Homework (p. 2)  
Due 8/13 at 10pm:  
Final Exam (U20) (Remotely Proctored) (p. 3) |
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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.