Course Name: CHEM 212, 4 credits
Prerequisites: CHEM 106X, MATH F107X or equivalent
Location: REIC 229 (lecture); REIC 245 (lab)
Meeting Time: MWF 9:15-10:15 (lecture); M 2:15-5:15 (lab)
Final: Wednesday, Dec 12, 8-10am

Instructor: Dr. Sarah Hayes
Office: Reichardt, 188
Phone: 907-474-7118
Email: s.hayes@alaska.edu
Office Hours: MW 10:30-12 and by appointment

Blackboard Link: http://classes.uaf.edu
Required Materials:
Harris, Quantitative Chemical Analysis, 8th ed. (978-1429218153)
Turning point clicker or smart phone app

Course Description: This course addresses aqueous chemical equilibrium as applied to chemical analysis, separations spectrophotometry, potentiometry and factors considered in the analytical approach. Lab portion will include introductory experiments in analytical and instrumental techniques. CHEM 212 builds on previous experience with general chemistry (106X or equivalent).

Instructional Methods: This class will be taught in a “flipped” manner, meaning lectures are recorded on video, posted on blackboard, and watched during out of class time. Time during the class will be spent answering questions about lecture material and working through problems. Daily quizzes will be given to assess student progress with the material.

Course Goals: Students will learn to understand the calculations underlying chemical equilibrium and learn associated analysis techniques: titrations, spectrophotometry, and chromatography.

Student Learning Outcomes:
• Students will become adept at chemical calculations. *Don’t be afraid of the math!*
• Students will be able to diagram, correctly apply, use, troubleshoot, and analyze data from a variety of spectroscopic and chromatographic instrumentation. *Instruments are super cool! Let’s learn how they work and how to use them!*
Course Policies:

Attendance and Tardiness- Students are expected to attend class and not compromise the experience of other students. A social contract will be negotiated between students and instructor on the first day of class.

Academic integrity, Plagiarism, Cheating- Students are expected to conduct themselves professionally and breaches of academic integrity will be dealt with in accordance with the Department of Chemistry and Biochemistry policies.

Participation- Much of this class is based on collaboration, making participation essential to success. Plan to bring your textbook, calculator and a good attitude to class.

Late work- Late work will not be accepted.

Disability Services- I will work with the Office of Disabilities Services (208 Whitaker Bldg, 474-5655) to provide reasonable accommodation to students with disabilities.

Course Evaluation:
Grades are assigned on the typical scale 90-100 A, 80-90 B, 70-80 C, etc.

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<tr>
<td>Hour exams</td>
<td>3 x 100 pts</td>
<td>300</td>
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<td>Final exam</td>
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<td>100</td>
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<tr>
<td>Labs</td>
<td>10 x 40 pts</td>
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<td>Quizzes</td>
<td>40 x 3 pts</td>
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<td>In class work</td>
<td>40 x 5 pts</td>
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<td>Total points</td>
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Exams- Of the four exams scheduled, I will average the three highest scores. If you are happy with the average of the first three scores, you do not have to take the final.

Labs- Ten labs will be performed during the semester, each worth up to 40 points. Of these,

10 points for coming to lab prepared with a procedure and data tables
10 points for accurate and precise measurements
20 points for lab write-ups.

Lab write-ups will be due the Monday after the experiment is completed.

Lab time is from 2:15- 5:15pm on Monday. Do not expect to leave early. If the experiment is done early, we will work on lab calculations in class. Please come prepared with everything you need to do that (eg., calculator, text book, etc). . Additional details will be discussed in class and grading rubrics and examples will be available on blackboard.
Homework- Students are expected to watch online lectures BEFORE class and take appropriate notes and list questions they might have. Clicker quizzes at the beginning of each class will be used to assess student understanding of the material from the videos. If students are not prepared, they will be asked to watch online videos during class and will miss out on participation points for that day.

In class work- The bulk of class time will be used for individual and group work. Arriving to class prepared and ACTIVE participation is required! Twenty percent of your grade (200 points) will be assessed on the basis of participation- not right answers! Bring your notes, a non-graphing calculator, and a good attitude to class.

Class topics:
See blackboard for a detailed, yet tentative, schedule:
Statistical treatment of data
Error and error propagation
Equilibrium
Gravimetric analysis
Electrochemistry
Spectrophotometry
Mass spectrometry
Separations/ chromatography