Tentative Course Schedule and Overview

Chemical Equilibrium & Analysis (Chemistry 212) 4.0 credits Fall 2021

Lecturer: Dr. Jingqiu Mao (REIC 188, 474-7118, jmao2@alaska.edu)
Office Hours: MWF 10:15-11:15 am or by appointment (drop-ins are welcome on a time available basis)
Lecture: MWF 9:15-10:15 am in REIC 203 Lab: M 2:15-5:15 pm; REIC 245
Text: "Quantitative Chemical Analysis", 10th ed.; by Daniel C. Harris and Charles A. Lucy or
"Quantitative Chemical Analysis", 9th ed.; by Daniel C. Harris
**** Current editions of textbooks on reserve in Rasmussen Library for 2 hr in-library use****

Required Materials: Text; non-graphing Scientific Calculator

Course Overview: Chemistry 212 is an examination of aqueous chemical equilibrium as applied to chemical analysis, separations, spectrophotometry, and other factors considered in the analytical approach. The course is delivered via traditional lectures and laboratory exercises.

Course Prerequisites: "C" or better grade in CHEM 106X and MATH 151X (or equivalents)

Additional Course Resources: See the course web page at: https://classes.alaska.edu/

Important Dates:	Last day to drop the course without a "W" appearing on transcript (100% tuition refunded)	Fri., Sept. 3rd
	Last day to withdraw from the course (a "W" will appear on transcript)	Fri., Oct. 29th

Policy on Cheating: Any student caught cheating will be assigned a course grade of "F".
As a UAF student, you are subject to the Student Code of Conduct (Board of Regents Policy; P.09.02). The university assumes that the integrity of each student and of the student body as a whole will be upheld. Honesty is a primary responsibility of you and every other UAF student. It is your responsibility to help maintain the integrity of the student community. In this course, the following items should be noted.

1. Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations
2. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.

Alleged academic conduct will be reviewed in accordance with procedures specified in regents policy, university regulations and UAF rules and procedures. For additional information and details about Academic Misconduct, please visit Center for Student Rights and Responsibilities .

Class Participation (Active Learning):

Homework: Success in Chem 212 requires practice doing problems. Higher achievement on exams is usually a direct result of time spent doing homework assignments in their entirety.

The class will be using an online homework system called Achieve. The **Achieve link** for our course is: **https://achieve.macmillanlearning.com/courses/7x569e.** Homework assignments and due dates will be posted in the Achieve system. Students have the responsibility of keeping track of homework assignments and due dates. **Failure to enroll in Achieve and complete the Chapter 1 Homework assignment by September 3th will be considered a failure to participate in the course and will result in a faculty initiated drop from the course.**

Other Class Participation Activities:

Group activities focusing on a particular day's reading assignment may occasionally be assigned in class. The organization of any group activities will be explained separately.
Quizzes: There may be several in-class quizzes during the semester. You will be allowed to drop the lowest quiz grade. Quiz grades will be calculated by averaging the remaining quiz scores. There will be no make-ups for quizzes.
Attendance: Class attendance is both expected and required. Non-attendance of course lectures and labs are penalized as follows: Missed course lectures (-0.5% of total course grade/lecture missed); Missed lab period (-5% of total lab score/missed lab period). Five (5) or more absences from class before Nov. 1st will result in a faculty initiated withdrawal from the course.

Exams
There are three scheduled in-class hour exams during the semester plus a cumulative final. All exams count toward the course grade. Make-up exams will be not be given for **any** reason. If you miss an exam due to illness, bring a note (and contact phone number) from your physician or other health care provider in order to have your absence excused. In cases of excused absences, grades will be assigned on the basis of a percentage of the remaining total points available (In effect, each exam, quiz, etc. accounts for a larger percentage of your course grade).
**** Please note that some exam questions may be different from homework questions in the Harris text. The relative amount of time available for exams and homework, the availability of computational facilities and the goals of the two activities are very different.

Course Grading Scheme:		
	3 Hour Exams @ 100 Points Each	300 pts
	Final Exam (comprehensive)	100 pts
	Homework, group activities, In-class quizzes	350 pts
	Laboratory work	250 pts
	Total	1000 pts

Percentages of 90, 80, 70, 60 correspond to grades of A, B, C and D. Percentages below 60 correspond to a failing grade (F). Plus and minus grades will not be awarded for this course.

University guidelines for course grades are as follows:

Grade	**University Guideline**
A	Indicates **a thorough mastery of course content**, and outstanding performance in completion of course requirements.
B	Indicates a high level of acquired knowledge and performance in completion of course requirements.
C	Indicates a satisfactory level of acquired knowledge and performance in completion of course requirements.
D	Indicates a minimal level of acquired knowledge and performance in completion of course requirements. This grade does not satisfy requirements for courses in the major, minor, core or graduate programs.
F	Indicates failure to meet the lowest standards. All "F" grades are included in the GPA calculation.

Notes:
1) a satisfactory or average level of performance (a "C") includes completion of all assigned course material. At the end of the semester, I carefully evaluate every students performance in the course.

Student Responsibilities:
Students are responsible for all material covered in class lecture. If you miss class for any reason, you will need to find out what you missed(including any changes in reading assignments). Students are responsible for reading the assigned material in the text **before** coming to class. Students should keep all returned, graded assignments until after final course grades have been posted on UAonline.

Course Goals

Students should exit the course with the following skills:

- the ability to perform quantitative dilution problems
- the ability to perform intermediate level equilibrium problem calculations
- an intermediate level of understanding of spectroscopy
- an introductory level of understanding of chromatography
- an introductory level of understanding of basic statistics

Student Learning Outcomes

Student learning outcomes will be assessed via statistical analysis of selected exam questions and an assessment exam given at the beginning and end of the semester.

Disability Services (http://www.uaf.edu/disability)

Students with a physical or learning disability, who may need academic accommodations, should contact the Disability Services office, located in the Center for Health and Counseling (474-5655, TTY 474-1827, fax: 474-5688.) You will need to provide documentation of your disability. Disability Services will then notify the instructor of any special accommodations required for students with documented learning disabilities.

Varsity Sports and University Sponsored Activities

Students participating in varsity level sports programs and/or university sponsored activities should contact the instructor at least two weeks prior any travel or activity that will require them to be absent from class.

Course Policies:

Continued attendance to class indicates each student agrees to the policies set forth in this syllabus.
Behavior and Collaboration- Students are expected to conduct themselves professionally at all times. Disrespect of the classroom learning environment, instructors, and fellow students is not tolerated! Collaboration and working in small groups is a key component of classroom and lab time.

Attendance, Tardiness, and Late Work- Students are expected to attend class and not compromise the experience of other students. Makeup labs are not available for this course except for school-related travel. Work is not accepted late. This is to keep us all moving though the material efficiently.

Instructor-Initiated Withdrawals- Any time up to and including the final date to drop a course with a “W,” the

professor has the right to withdraw a student that "...has not participated substantially in the course."
Honor code and Academic integrity- Students are expected to conduct themselves in accordance with the UAF Honor code. The Chemistry Department policy states: Any student caught cheating will be assigned a course grade of F. The students academic advisor will be notified of this failing grade and the student will not be allowed to drop the course.

Disability Services- I will work with the Office of Disabilities Services (208 Whitaker Bldg, 474-5655) to provide reasonable accommodation to students with disabilities. It is the student's responsibility to make an appointment with me to discuss appropriate accommodations. A letter from disabilities services must be provided.

Tentative Schedule

Unit1: Data Treatment (Chapter 0-5)
Error and error propagation
Statistical treatment of data
Calibration Techniques
Quality Control and Quality Assurance
Exam 1

Unit 2: Equilibrium (Chapter 6-11)
Solubility
Acid-Base
Chelation
Exam 2

Unit 3: Instrumentation (Chapter 13-20)
Electrochemistry
Spectrophotometry
Chromatography
Exam 3

Final Exam on Wednesday Dec 8th, 8-10am.

Review Safety Features in the Lab (REIC 245)

- Cubbies for bags and coats
- Location of personal protective equipment (PPE)
- Safety shower/eyewashes
- Fume hoods
- Exits out of room and out of building
- Waste bottles and broken glass container(s)
- Chemical/safety literature
    - hazard.com/msds is a good start

Laboratory Safety Rules

- USE COMMON SENSE AT ALL TIMES!!!
- No horseplay in lab
- No unauthorized experimentation
- Wear safety glasses/goggles—know when each is required
- Use of correct gloves (when appropriate)
- Knowledge of location and use of MSDS's
- NO food, drink, or gum in lab
- Do not leave fires unattended
- Label all containers with contents, your name, your class, and date/semester
- Report any accident or spill or unsafe condition
- Observe proper storage of chemicals
- Properly disposing of laboratory waste
- Use caution around heat sources, cold sources, flame, electrical equipment
- Properly disposing of glass
- Safely handling chemicals
- No open-toed shoes, no shorts in lab
    Recommend no skirts, hair tied back, no loose sleeves/clothing

Other Important Rules

- This is shared lab space
    - Clean up after yourself
    - Follow storage rules
    - "Default Dirty" Assume benches/glassware is not as clean as you would like.

- Wash your hands frequently
- LABEL EVERYTHING!!!!!
- Use caution if you must transport samples to other rooms
- Inform your instructor and/or TA if you use the last of something or break something
- You are responsible for your own safety, and the safety of everyone else in this room

Good safety = good lab technique = good result