Syllabus for ANALYTICAL CHEMISTRY II: 4:112 (CHEM:3120:0001)
Spring 2014, Monday, Wednesday, Friday, 10:30-11:20 am in W228 CB

INSTRUCTOR
Prof. Amanda J. Haes
Office/Office Hours Location: 204 IATL
Office Hours: Mondays, 3 – 4:30 pm; Wednesdays, 8:30 – 10 am; or by appointment
Phone: (319) 384 – 3695
Email: amanda-haes@uiowa.edu

Grader: Zhenzhu Xu (zhenzhu-xu@uiowa.edu)
DEO: Prof. Mark Arnold, Department of Chemistry; Office: E331 CB; Phone: 335-1368/335-1350

DESCRIPTION OF COURSE
This course provides an introductory survey of modern instrumental techniques in spectroscopy and separations. Specific topics in separations include gas chromatography, high performance liquid chromatography, and electrophoresis. Specific topics in spectroscopy are atomic spectroscopy, molecular UV visible absorption and luminescence spectroscopy, vibrational spectroscopy, and mass spectrometry.

Prerequisite: Chemistry 4:111 (CHEM:3110) or by permission

OBJECTIVES AND GOALS OF THE COURSE
Learning objectives for this course will focus on developing a fundamental understanding of the following topics as they relate to analytical chemistry (i.e., separations and spectroscopy).

- Understand the fundamental principles of, procedures used, and relevant terminology associated with separations and spectroscopy
- Relate knowledge and understanding to critically evaluate the function, use, and limitations of modern separations and spectroscopy instrumentation
- Develop the intellectual skills to integrate theory and practice related to separations and spectroscopy to solve qualitative and quantitative problems with familiar and unfamiliar contexts
- Apply knowledge regarding the physical principles discussed to problems in separations and spectroscopy using mathematics (including statistics) and basic chemistry and physics concepts

TEXTBOOK

COURSE WEBSITE
http://icon.uiowa.edu (Access with your username and password) – lectures, homework, and up-to-date point totals will be available here. You may also be required to submit documents on this site.

GRADING SYSTEM AND THE USE OF +/-
Grades will be assigned and based on the distribution of point totals. The average score will likely lie at the B-/C+ border, and the overall grade distribution will approximately follow the College guidelines for advanced courses (22% A, 38% B, 36% C, 3% D, 1% F). The +/- grading scale will be used. Exceptional performances will receive an A+.

EXAMS, ASSIGNMENTS, AND PERCENTAGE OF FINAL GRADE
The course grade will be determined from the following elements:
- In-class quizzes – 3@50 points = 150 points (your 3 highest scores out of 4 quizzes) (25 %)
- In-class exams – 3@100 points = 300 points (50 %)
- Final exam = 150 points (25 %)
- Activities = TBD (Bonus)
- Total = 600 points
COURSE POLICIES REGARDING EXPECTATIONS, ATTENDANCE, ABSENCES

- A 3 hour class typically entails at least 2 hours of outside preparation for the average student per each hour spent in class. You are expected to study an additional 6 hours/week outside of class.
- Attendance on quiz and exam days is required. If you have to miss class on one of these days, please notify me in advance by filling out the form “Explanatory Statement for Absence of Class” and submitting it to me electronically (via email or in the dropbox folder (“Explanatory Absence Forms”)) on ICON.
- There will be no make up opportunities for activities or unexcused absences on exam/quiz days.
- Make up quizzes and exams must be scheduled BEFORE the original exam/quiz starts and taken within 48 hours of the originally scheduled exam/quiz time. Additional accommodations will be provided if warranted.
- Please silence all cell phones during class.
- Refrain from using electronic devices for non-course related purposes during class.

HOMEWORK, QUIZZES, EXAMS, ACTIVITIES

If you have a valid reason for missing any exams/quizzes, you must notify the instructor BEFORE it begins. If you have a valid excuse, makeup exams/quizzes must be completed within 48 hours of the originally scheduled event. Please note that extra credit activities will not be announced in advance. There are no makeup in-class activities. These opportunities will only benefit you if you attend class.

- Reading and Homework: You are expected to read the assigned textbook sections and work through the suggested homework problems. Homework problems will not be graded. I encourage you to solve the problems in groups and independently as doing so will help you achieve the outlined learning objectives for the course. Additionally, portions of these questions will be used for questions on quizzes. Answers are available in the back of the book or an answer key is available to look at during the instructor’s office hours. Please note that some of the answers in the back of the book are incorrect. Working through other questions in the assigned reading and at the end of the chapters are also excellent methods for you to learn this material and demonstrate your expertise.

- Quizzes: There will be four in-class quizzes (50 points per quiz). These quizzes are scheduled during class and will emphasize your knowledge related to terminology, general concepts/trends, and/or block diagrams. The three highest scores will be used in your final grade calculation.

- Exams: There will be three in-class hour exams given during the course along with a comprehensive final exam. The final exam will consist of 100 points derived from all the course material and 50 points based on material covered after Exam #3. Sample exams are available on ICON.

- Extra Credit Activities: In-class activities which emphasize course topics may be used throughout the course. These activities will focus on transferable skill development and problem solving. Students will be randomly divided into small groups. The instructors will present a problem in class, and groups will work together toward solutions. Students who attend class on these days will be required to turn in documentation during class (worth up to 10 bonus points each).

A NOTE ON COLLABORATION

The homework and in-class activities for this course are designed to help you master your knowledge related to the topics covered during lecture and in the textbook. As such, homework is not graded and activities are optional. All assignments turned in for credit must represent your work and understanding (collaboration is not allowed on what you turn in for credit). Do not share your completed work with others or ask others to see their completed assignments because both are considered academic misconduct. Students are responsible for understanding this policy; if you have questions, ask for clarification.

A WORD ABOUT THE DATE AND TIME OF THE FINAL EXAM

The final examination date and time will be announced by the Registrar generally by the tenth day of classes. I will announce the final examination date and time for this course at the course ICON site once it is known. Do not plan your end of semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.
CALENDAR OF COURSE ASSIGNMENTS AND EXAMS

Important Course Deadlines (These will take place during class unless noted. Your attendance is mandatory on these days.)

January 31………Quiz 1
February 14……..Exam 1 (Material covered through February 10 and reviewed on February 12)
February 28……..Quiz 2
March 14………..Exam 2 (Material covered after Exam 1 and reviewed on March 12)
April 4……………Quiz 3
April 18…………..Exam 3 (Material covered after Exam 2 and reviewed on April 16)
April 4……………Quiz 4
TBA……………. Final Exam (Material covered throughout the course, Time and Place TBD)
Unannounced….. Activities

COURSE TOPICS, RELEVANT READING, AND SUGGESTED HOMEWORK

Topics will be selected from and presented in the following order as time permits. Slides shown during class will be posted on ICON.

1. Lecture Pack 1: Course Overview and Brief Review
   a. Expected Reading: Chapters 1A-B, 1E

2. Lecture Pack 2: Separations – Introduction, Gas Chromatography, HPLC, and Electrophoresis
   a. Expected Reading: Chapters 26, 27, 28, 30A-B
   b. Suggested Homework Problems: 26-14, 26-15, 26-16, 27-22, 28-22, 30-5, 30-6

3. Lecture Pack 3: Spectroscopy A – Introduction to Signal/Noise, Quantification, and Instrumentation
   a. Expected Reading: Chapters 6, 5A-C (to page 119), 13C3-C4, 1D (should be a review), 7A-E
   b. Suggested Homework Problems: 6-2, 6-3, 6-7, 6-8, 6-11, 5-8, 1-9, 7-5, 7-12

4. Lecture Pack 4: Spectroscopy B – Atomic and Molecular Spectroscopy
   b. Suggested Homework Problems: 8-1, 9-14A, 13-1, 13-2, 13-5, 13-9, 14-8, 15-9, 16-1, 16-5, 16-6,
      16-7, 16-9, 16-13, 16-14, 17-1, 17-10, 18-3, 18-4, 18-7

5. Lecture Pack 5: Mass Spectrometry – Introduction, Instrumentation, and Methods
   a. Expected Reading: Chapters 11A-B, 20A-C
   b. Suggested Homework Problems: 20-6, 20-7, 20-11
ADMINISTRATIVE HOME
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at http://clas.uiowa.edu/students/handbook.

ELECTRONIC COMMUNICATION
University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences (Operations Manual, III.15.2, k.11).

ACCOMMODATIONS FOR DISABILITIES
A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

ACADEMIC HONESTY
All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

CLAS FINAL EXAMINATION POLICIES
The final examination schedule for each class is announced by the Registrar generally by the tenth day of classes. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

MAKING A SUGGESTION OR A COMPLAINT
Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

UNDERSTANDING SEXUAL HARASSMENT
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

REACTING SAFELY TO SEVERE WEATHER
In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.

These CLAS policy and procedural statements have been summarized from the web pages of the College of Liberal Arts and Sciences and The University of Iowa Operations Manual.