Instrumental Analytical Chemistry
CHEM 413W Spring 2009

A writing intensive course focused on the acquisition and interpretation of chromatographic and spectroscopic data for quantitative chemical measurements.

Contact Information: Dr. Todd Gouin

office: Reichardt 192
telephone: 907 474-1966
email: fftg@uaf.edu

Office hours: Tuesday and Thursday 2pm - 4pm; Friday 11am - 12pm

Course objectives:

The purpose of this course is threefold:

- To develop skills of **effective experimental planning and execution.**
- To develop skills in **critically evaluating** observations and data.
- To develop **written communication skills** in the context of chemical science.

Course overview:

This course is the lab component of CHEM412, and presupposes a certain level of understanding in the theory of instrumental analytical chemistry. The emphasis of this course is to apply much of the theory students were exposed to in CHEM412 to assessing relevant and timely chemical issues that rely on the effective use of modern analytical instrumentation. The effectiveness of this course relies on student participation, which includes active involvement in researching, planning, executing, and interpreting data for a number of issues that will be explored in four major research projects.

This course is designated writing-intensive (W), which means that the students grade will be based primarily on their written work, with an emphasis on content and organization. The following are the requirements that meet the writing-intensive designation:

1 A research project: Students will go through stages of turning in a draft project proposal and methods outline with a bibliography prior to performing the lab experiment. The students will receive written feedback, and I will meet with each student individually after they have turned in the draft outline of their projects to discuss their writing and project proposal. After completing the experiment, students will interpret their data and present their results, along with a draft of their results and discussion section, and will receive feedback from myself and other students in the class. Finally, students will submit a final version of their research project, written in the style of a research journal article.

2 Writing assignments based on specified topics and readings. The grade will be based on the clarity of presentation, integration of points from the reading(s), critical thinking, and insightful and creative thought. Students will receive written feedback on their writing for each of the writing assignments.

3. Poster presentation and presenting results to the UAF chemistry community. Students will prepare posters on each of the four projects investigated through the course within groups, and will present their results from the course to the Chemistry and Biochemistry Department at the end of the term.

A note about first drafts: First drafts must be original student products. The draft provides an indication of the writing style of each student, how much progress the student has made in the assignment or project, and demonstrates the students ability to write independently using resources (journal articles, textbooks, lecture notes, etc.). The amount of work and attention to detail students put into the draft will vary, depending upon aptitude, initiative, and motivation of the student.

Evaluation and grading

Quizzes & Assignments 20 % Projects 70 % Participation 10 %

Total 100

Final grades will be based on the students earned percentage of the total possible points, using the University's plus/minus grading scale (90.0 – 100 = A; 87.0 – 89.9 = A-; 83.0 – 86.9 = B+; 80.0 – 82.9 = B; 77.0 – 79.9 = B-; 73.0 -76.9 = C+, and so on).

Textbook (optional)

Fundamentals of Analytical Chemistry by Skoog, West, Holler and Crouch.

How the course works

Lectures & Labs

Lectures: Fridays 2:15pm-3:15pm
REIC 165

Labs: Mondays and Wednesdays 2:15pm-5:15pm REIC 245

Lectures will provide a review of material covered in CHEM412 as well as instruction on experimental design, QA/QC, data analysis, and report writing. Handouts of journal articles and the textbook will complement the lecture material. The laboratory experiments will be the primary means by which the goals of the course will be realized. Students will be responsible for designing the experiments necessary to support their projects, thus it is important to prepare and review material well in advance. A laboratory notebook will be used to outline the experimental approach, and to record information. Students must keep an up-to-date laboratory notebook.

Course Policies

CHEM413 is governed by the academic regulations at UAF, found in the 2008-2009 Academic Calendar (pp. 78-84). Some additional policies are specific to CHEM413, and are listed below:

Assignments:

- Assignments are to be submitted by the assigned date during class time (lecture or lab), or before the assigned date via email. Please do not submit assignments under my office door.
- Your graded assignments will normally be returned the week following the assignment's due date.
- If you feel that any assignment has been incorrectly or unfairly graded, please put your argument in writing (Note: no written argument, no re-grade), attach it to the original assignment, and deliver it to me. I will then remark the *entire* assignment. The new mark, which could be either higher or lower than the original mark, will be your grade.
- If you are late on an assignment, **a penalty of 5% per day is applied up to 5 calendar days**, and after then it will not be marked. An extension may be granted under exceptional circumstances (e.g., medical condition, family emergency).
- The labs are an essential part of the course and **attendance is required**. **Absences and lateness will affect the Participation component of your grade.** You simply cannot learn nor contribute to others' learning when you are not in class or disrupt it by arriving late. Since your success in the class largely depends on your ability to complete the assigned projects, it is important for you to be an active participant.
- I encourage you to make use of the Writing Center (8th floor, Gruening Building) where you can take a draft of any writing for assistance. Drafts of your projects will be graded, and I will provide feedback. Thus, the more substantial your draft, the more substantial the feedback.

Referencing your work & plagiarism:

- Where applicable, you are expected to provide references for all of your assignments. References serve three purposes: (1) to credit others for their ideas; (2) to demonstrate your understanding of the literature; and (3) to allow the reader to refer to the original reference for further detail or interpretation. Detailed references should follow the citation conventions of one of the following: Nature, Environmental Science & Technology.

Plagiarism is an extremely serious academic offense as outlined in the University Calendar and carries penalties varying from failure in an assignment to suspension from the University. Plagiarism is defined as appropriating passages or ideas from another person's work and using them as one's own. Lifting passages of text from the Web is also plagiarism and will not be accepted.

Students with documented disabilities: Students with a physical or learning disability, who may need academic accommodations, should contact the Disability Services office (203 WHIT, 474-7043). Disability Services will then notify the instructor of special arrangements for course work.

Computer Lab: Your enrollment in CHEM413 gives you user privileges in the department's computer lab. Information and policies are available at www.uaf.edu/chem/NewNetwork.html.