Course Name: Chem 413: Instrumental Lab.

Prerequisites: Chem 212, 332 (co).

Location: Reichardt Building 245 (Lab), 138 (lect)

Meeting Time: MW 2:15-5:15 (lab), F 2:15-3:15 (lect)

Blackboard Link: http://classes.uaf.edu

Please note: Check your blackboard information – particularly your e-mail address.

Instructor: Dr. Tom Trainor

Office Hours: T&TH 2-4PM (other times by appointment).

Office: Department of Chemistry and Biochemistry
Reichardt Building
Room 176

Phone: 907 474-5628
E-mail: tptrainor@uaf.edu

Reference Materials:
- Skoog, Holler and Crouch, Principles of Instrumental Analysis
- Harris, Quantitative Chemical Analysis

Course Description:
This is a laboratory course focused on the planning, execution and interpretation of chemical analysis using modern analytical instrumentation. A major component of the course is the formulation of specific questions, identifying appropriate analytical methods and the preparation and communication (in writing) of sample preparation and analysis protocols. You will be expected to provide detailed description of your analysis in a manuscript format.

Grading
- Project definition (written report): 25%
- Sample and instrumental protocols (written report): 25%
- Preliminary analysis (written report): 10%
- Final written report (manuscript style): 30%
- Course participation and lab techniques: 10%
Lecture topics, tentative (Friday sessions):

- Basic statistics review
- Least-squares analysis
- Data comparison
- Experimental Design

Reports:
The major focus of this course is the preparation and evaluation of reports at each stage of an analytical investigation. You will be expected to submit your draft documents according to the course schedule, these documents will be reviewed (peer and instructor) and returned for revision. Revised documents will be reviewed again prior to being accepted (and receiving final grade). The essential reports are:

- Project definition: a detailed description of the samples you intend to analyze, techniques you intend to use and justification for the analysis.
- Sample preparation and instrumental protocols: a detailed description of the procedures you intend to use to prepare and analyze your samples. This should be light on theory and heavy on step-by-step instructions. It must include a detailed description of all reagents and equipment needed (and quantities). It should also include references to your sources of information and a description of how the data will be processed to its final form.
- Preliminary analysis: a brief written report detailing the results of your analysis.
- Final report: The final report will be a journal style manuscript based on your laboratory project.

Course procedure:

- The class will be broken into two groups, based on similarity of interest (in terms of sample/matrix types to be analyzed and instrumentation to be used)
- Each individual in the group will develop their own project based on a set of samples to analyze (each student/project therefore has a unique question/hypothesis to be addressed).
- The group members will all collaborate on each others projects by
  - Providing an initial round of feedback to each other on their initial research plan
  - Collaborating on instrumentation and sample preparation protocols (this will be a single document for each group with sections that are either generic to the group in general or specific to an individual or group of individuals depending on sample types. The compiled document will be reviewed by the other group as well as the instructor and TA.)
  - Working together to execute the laboratory work.
  - Providing feedback on drafts of preliminary analysis, and help with subsequent lab work.
  - Working on each others manuscripts in a co-author capacity.

Note that prior to any lab work we need to have a detailed plan. Laboratory periods in the first few weeks of class will be devoted to developing the plans and going over documents/reviews.
UAF GUIDELINES FOR CORE WRITING INTENSIVE DESIGNATOR:

A. General guidelines for 3-credit course with "W" designator

1. The lower-division writing sequence as specified in the Core Curriculum will be a prerequisite for all "W"-designated courses.
2. Instructors are encouraged to have students write an ungraded diagnostic composition on or near the first day of class to help assess writing ability and general competence in the discipline. [If diagnostic tests indicate that remedial work may be needed, teachers can set up specialized tutoring for their students with UAF Writing Center tutors.]
3. Teachers regularly evaluate students' writing and inform students of their progress. If a major written project (research project) is part of the course, the project should be supervised in stages. If possible, a writing activity should comprise a major portion of the final examination.
4. At least one personal conference should be devoted to the student's writing per term and drafts of papers should receive evaluation from the teacher and/or peers.
5. Written material should comprise a majority of the graded work in the course for it to be designated "intensive." "Written material" can consist of quizzes and exams with short answers or essay sections, journals, field notes, informal responses to reading or class lectures, structured essays, research projects, performance reviews, lab reports, or any forms suitable to the discipline being taught.

B. Guidelines for the "W" designator in Technical courses

1. In order to ensure that technical disciplines can meet the goals of the writing intensive requirements without compromising the technical quality of their courses, such disciplines may substitute longer courses or a series of courses (typically 1-credit labs) for each of the two necessary 3-credit writing intensive or "W"-designated courses. Courses meeting all the general guidelines will, of course, also be acceptable.
2. The longer course option allows the "W" designator for a 4- or 5-credit course in which written material comprises a portion of the grade equivalent to "a majority" of a 3-credit course. The course must also meet the other general guidelines.
3. The series option allows a student to replace one or both 3-credit "W" courses with a series of courses, each of which may be less than three credits--e.g., a series of 1-credit or 1-credit-equivalent laboratories. Each series, however, must sum to the equivalent of at least one 3-credit "W"-designated course. The initial course in the series will be designated "W1" and, while less than three credits, will fulfill all the other general requirements for a "W." The subsequent courses will base a majority of the grade on written material. Students must take the "W1" course before taking the other courses in the series.

** To grade a course on written work means to use the student's written work as the basis for his or her grade. Written work is graded mainly on content and organization, with tone, word choice, sentence structure, grammar, punctuation, and spelling accounting for a smaller fraction of the grade.