ENVS193XL Special Topics: Environmental Chemistry Laboratory
Spring 2016

Instructor: Helene K. Gardner  
Please be aware that there is another hgardner on campus. Please take care when emailing me that you do not inadvertently email her.

Class Time and Location: Mondays 2:00-4:50; Phelps 2525
Office Hours:  W and F 1:15-2:45

ENVS193XL is the shakedown cruise for the newly-commissioned ENVS15L. This will be the laboratory for the new two-quarter ENVS15, which will take the place of the historical requirement of CHEM1A and ENVS15.

This laboratory is designed to demonstrate and reinforce concepts critical for a working environmental scientist. Some exercises will provide the opportunity to use equipment to measure parameters in a field setting (#1, 4, 5, 9), others will provide opportunity to use laboratory techniques and instrumentation (#2, 3, 6, 7, 8), in some instances, to assess the same parameters as those measured in the field, so that students can develop an understanding of the limitations of field measurements. In other exercises, students will observe concepts presented in lecture (#1, 4, 6, 7), and, in still others, they will have the opportunity to become familiar with techniques that form the basis for analyses that they may very well call on a contract lab to perform in the course of their professional careers (#3, 7, 8).

Tentative schedule:

Week 1: Characteristics of Radiation
Week 2: Recycling of an Aluminum Can
Week 3: Analysis of Iron by Visible Spectrophotometry
Week 4: Comparison of Portable pH and NO₃ Measurement Techniques
Week 5: Soil and Water Sampling
Week 6: Laboratory Testing of Soil and Water Samples Using Ion-Specific Electrodes
Week 7: Alkalinity Titration
Week 8: Chromatography
Week 9: Air Monitoring

Grading:
30% weekly pre-lab quizzes; the lowest grade will be dropped
60% weekly lab reports; the lowest grade will be dropped
10% lab conduct (lab safety, waste disposal, keeping work space clean, being a good lab citizen, etc.)
The laboratory write-up format is as follows:

Heading: Your name, date, course number, and your lab partner’s name
Title: Description of the laboratory exercise
Abstract: A brief overview of the entire report with a sentence or two that is a summary of each section
Introduction: Why are we doing the experiment? What question are we asking/hypothesis are we testing/concept are we demonstrating/technique are we practicing?
Materials and Methods: This is where you explain the experimental procedure in enough detail that someone else could duplicate it
Hypothesis: What do you think is going to happen?
Results: Your raw data (initialed by whomever is overseeing the lab) will be attached but you will present your data in tabular and/or graphic form as appropriate. Include error calculations (% yield, etc.) as appropriate
Discussion: What do your data mean? If they are not what you expected, why not? Include an error analysis, including why your yield was high/low, if appropriate. This is where you tie your work into the broader scientific community/apply it/answer any questions posed in the laboratory hand-out
Conclusion: What did you learn from the exercise? How would you sum up your findings? Was your hypothesis correct? If not, why not? What future studies would you recommend?
Be complete but concise.

Apparel:
1. Students must wear a lab coat and protective eyewear; these can be purchased in the bookstore, but you should already have them from CHEM 1A
2. Legs and ankles must be covered so that no skin is showing
3. Sturdy, closed-toe shoes must be worn
4. Long hair must be pulled back

Eating, drinking, and smoking are not permitted, and smoking is not permitted in the hallway outside of lab. (This is a no smoking campus, so this is a moot point, nevertheless…)

Horseplay will not be tolerated.

There is no possibility for a missed pre-lab quiz or laboratory exercise to be made up, so please make every effort to attend lab. If you still must miss lab, this will be the quiz and lab report the grade for which will be dropped.

Your raw data must be signed before you leave lab. This will be included in the lab report.

The university policy on academic honesty will be enforced with vigor. Unoriginal work and any other evidence of academic dishonesty will be awarded a grade of zero.