Environmental Chemistry Lab **University of Mary Washington**
Chemistry 332 **Spring 2019**

Laboratory: W 1:00 – 3:45 (Jepson 210)

Instructor Dr. Charles Sharpless Jepson 341 (654-1405) csharple@umw.edu

Office Hours Walk-in: MWF (11-12), T (10-12) Appointments also welcome!

Required Materials: lab notebook (carbonless), safety goggles, scientific calculator

Course Website: https://canvas.umw.edu/

Course Objectives: This course is designed to introduce you to common procedures for analyzing environmental samples such as water, air, sediments, and plant tissues. Although the course does not parallel the topic coverage in Chem331 (Environmental Chemistry), much of what we will study reinforces concepts from 331.

The techniques we will use include wet methods, such as titrations and extractions, and instrumental methods, such as spectroscopy and chromatography. The course does not provide rigorous coverage of the theory or instrumentation involved in these techniques, nor does it serve as thorough training to be an environmental analytical chemist.

Grading: All grading will be based on lab reports (see below), which will be graded according to the rubrics posted on Canvas. I use these to guide my grading, and you can use them to guide your report preparation. All lab reports count equally towards your final grade in the course (i.e., each is 20% of the grade). The first two labs are due before midterm and constitute your midterm grade.

***** *Students with a grade of C- or below on 3/9 will receive a mid-semester deficiency report.*

* *No late assignments will be accepted without my prior consent.*

* *Missed laboratories may not be made-up without my prior consent.*

Class Attendance: Attendance is mandatory. There is no text, so many of the techniques and virtually all of the concepts that you will need to carry out successful experiments will be covered in class. Labs cannot be made up without my prior consent except in the case of a legitimate emergency.

Lab Exercises: There is no lab manual for this course. Experimental procedures and associated readings will sometimes be covered in pre-lab lectures and/or posted on Canvas. I will announce when items are posted on Canvas.

Lab Reports: There are two formats for lab reports in this course as noted on the lab schedule.

Handout: These are much like the reports you encountered in Chem111 and 112. There will be a pre-formatted report sheet for you to report your results along with a few brief questions to answer. These must be submitted along with copies of your notebook pages.

Formal: These are 3 to 5 page reports written in the general style of a scientific paper, albeit substantially shorter and without an introduction. An example report will be

posted on Canvas for your reference. They must be double-spaced with 1.25" margins with the following organization:

i) Your name, the experiment title, and the date
ii) An *Abstract*, briefly stating the purpose and major findings of the experiment
iii) A brief summary of the *Experimental Procedure*
iv) Presentation of *Results*, including relevant graphs, tables, and a brief discussion describing and interpreting your results
v) Copies of your lab notebook pages stapled to the end of the report. All calculations must be done or at minimum described in you notebook (i.e., if you used Excel for calculations, you must still write out some equations and describe the calculations in the notebook).

Lab Safety: Laboratory work has potential risks (e.g., exposure to hazardous chemicals, minor injuries, such as cuts and burns). During the first lab, we will go over basic laboratory safety and discuss the requirements for personal protection. We will also cover the UMW Chemistry safety rules. In order to participate in this course, each student must sign a statement in which he or she acknowledges the risks associated with the course and agrees to follow all safety rules and to assume responsibility for his or her actions in the laboratory.

Disability Resources Students who require or feel they may require accommodations due to a disability should visit the Office of Disability Resources, http://academics.umw.edu/disability/. A detailed course-specific accessibility statement can be found at: https://tinyurl.com/332DRS19

Honor System In accordance with the University's Honor Code, all work submitted for grading must be your own and be pledged as such by writing at the end of the work, *"I hereby declare upon my word of honor that I have neither given nor received any unauthorized help on this work. (your signature)".* It is your duty as students and mine as faculty to uphold the Honor Code, which is described in detail in the Guidebook & Constitution (https://academics.umw.edu/academicintegrity/academic-integrity/guidebook-and-constitution/). Suspected violations of the Honor Code will be addressed according to the policy established by the Honor Council.

In the laboratory, you will often work together to collect data. Helping each other with a task or to understand the procedures is acceptable. However, it is not acceptable if one student is doing all the labor, or repeatedly issuing instructions to or doing his/her partner's work. If you find that you need help understanding the material in lab (or lecture), please see me.

Classroom Recordings Classroom activities in this course may be recorded by students enrolled in the course for the personal, educational use of that student or for all students presently enrolled in the class only. More policy details are at https://tinyurl.com/332CRS19

Title IX Statement UMW is committed to supporting students and upholding the University's Policy on Sexual and Gender Based Harassment and Other Forms of Interpersonal Violence. Under Title IX and this Policy, discrimination based upon sex or gender is prohibited. If you experience an incident of sex or gender based discrimination, we encourage you to report it. You may talk to me, but understand that as a "Responsible Employee" of the University, I must report to UMW's Title IX Coordinator what you share. More information can be found here: https://tinyurl.com/332TNS19

Chem332 Schedule, Spring 2019 (subject to change)

Date	Lab Exercise	Report Style
Jan 14th	Introduction and overview	-
Jan 21st	Basic water characterization (alkalinity, hardness, TDS, and conductivity)	Handout
Jan 28th		
Feb 4th		
Feb 11th	Comparison of PAHs found in sediments and soils (sampling, extraction, and GCMS analysis)	Formal
Feb 18th		
Feb 25th		
Mar 4th	Spring Break	
Mar 11th	Capsaicin in chili peppers (extraction and analysis by HPLC)	Handout
Mar 18th		
Mar 25th	Effect of temperature on dissolved O_2 (amperometric measurement, determination of ΔH of solution)	Handout
Apr 1st		
Apr 8th	CO_2 in air & exploration of its radiative forcing	Formal
Apr 15th		
Apr 22nd		

RELEASE FORM FOR CHEMISTRY LABORATORY STUDENTS

Please read carefully before signing.

I, _____, fully understand that there are hazards associated with performing new and unfamiliar procedures in a chemistry laboratory. I further understand that by signing up for CHEM _____ I must be especially careful to follow all safety rules and procedures while working in the laboratory. In addition to abiding by the Departmental safety rules, I agree that…

(1) I will receive appropriate safety training, and afterwards I will follow all proper safety guidelines for working in the chemistry laboratory;

(2) I will not work alone in the laboratory, and I will always have at least one other person, who has also had appropriate safety training, present with me in the laboratory when I am performing any procedure:

(3) I will not perform unauthorized experiments, meaning that all experimental procedures will be approved before I perform them and that the quantities of reagents used will be no greater than the amounts delineated in the approved procedure (but they may be scaled down to lesser amounts);

(4) I take full responsibility for my actions and for any injuries that I may incur as a result of performing the approved experimental procedures, and I will not hold the University of Mary Washington, the Chemistry Department, or Dr. Sharpless responsible should an injury occur;

(5) If I take any action that puts me or anybody else at unnecessary risk of injury, I will immediately be dismissed from the laboratory and lose the privilege of participating in the laboratory portion of the course;

(6) If I lose my right to work in the laboratory, I am solely responsible for lost time and any subsequent loss of grade points resulting from deadlines that cannot be met;

(7) I will not remove anything from the laboratory;

(8) I will report any accidents immediately to Dr. Sharpless and the departmental safety officer, Dr. Oldham;

(9) I will report any damaged or malfunctioning equipment or safety violations to Dr. Sharpless, to the departmental safety officer, Dr. Oldham.

Signed: _____ Date: _____