

## Quantitative Analysis Lab

### Chem 222

Course Date: Tues. Aug., 23, 2016 through Thursday, Dec., 8, 2016

Location: Fulmer 207

Meeting day/Time: Section 1 (Tuesday/Thursday): 2:50- 5:40 PM

Prerequisite: Chem 220 with a C or better or concurrent enrollment

#### Instructor Information

Prof. Jeremy Lessmann

Email: [jlessman@wsu.edu](mailto:jlessman@wsu.edu)

Office: Fulmer 311

Office Hours: By Appointment or Tues/Thurs 9:30-10:30 or Fri 1-2

Phone: 509-335-2098

TA: TBA

**Highly Recommended textbook: Quantitative Analysis, Daniel Harris, 8<sup>th</sup> ed or 9<sup>th</sup> ed.**

#### Course Requirements and attendance:

Chem 222 is an intensive, hands on laboratory course. Your ability to obtain accurate and/or precise results is a key factor in measuring your success in the course. In cases where group work is required, the effort of each individual will be taken into account when assigning grades. Students with legitimate WSU approved absences or medical excuses will be allowed to make up one missed lab.

#### Required Materials

1. Scientific Calculator
2. Approved Safely Goggles
3. Lab coat
4. Duplicating Notebook (You can reuse ones from other courses)
5. Access to a Personal Computer and printer. (You have access to the computers in Fulmer 401)
6. USB thumbdrive

**Student Learning Outcomes:** (Chemistry Dept. Outcomes in () as given at <https://undergrad.chem.wsu.edu/majoring-in-chemistry/>)

At the end of this course student will be able to:

1. Perform the most common forms of chemical analysis to quantify properties of an unknown chemical compound, gravimetric analysis, titrimetric analysis, atomic and molecular optical spectroscopy, gas chromatography, and potentiometric measurements. **(2,7)**
2. Perform basic statistical analysis of data including the proper use of averages, standard deviations, propagation of error and errors in calibration curves. **(2,5,7)**
3. Setup and use of calibration curves, standard addition curves and internal standard methods to quantify unknowns. **(5)**
4. Prepare solutions for chemical analysis especially the preparation of solutions with accurately known concentrations and the dilution of solutions to useful concentration ranges. This includes the use of commonly encountered laboratory equipment (analytical balance, pipettes and pipettors, volumetric glassware...). **(1,5)**
5. Apply the theory of chemical equilibrium and solve practical chemical problems. **(1,2,7)**
6. Keep a laboratory notebook and write formal laboratory reports. **(4,7)**

**Assessment of Learning Outcomes:**

Assessments of the above learning outcomes are provided for in the student prepared laboratory reports.

**Lab Reports:**

Lab reports have 2 parts a pre-lab and a post lab. Reports are due as stated in the due dates page in the Lesson section on Blackboard. Points will be deducted from late work at a rate of 10% per day late. NO EXCEPTIONS. Reports more than 1 week late will not be accepted unless prior arrangements are made with the TA (NOT the Instructor). It's better to turn in something rather than nothing.

**Grading Policy**

*Accuracy:* Approximately 10 points of your Lab report grade for certain experiments (indicated in the lab manual) will be based on the accuracy of your results. Specific ranges are in a table in the lab manual introduction.

*Evaluation:*

Statistics Assignment	150 pts
Pre-labs (12 @ 30 points)	360 pts
Post-Lab report (12 @ 70 points)	840 pts
Formal Reports (3 of above)@ 50 pts extra	150 pts
<u>Lab Practical</u>	<u>200 pts</u>
Total Possible	1700 pts

+ and - grades will be given within each grade range (i.e. A, B, C, etc.). Standard Grade Cutoffs are used. (The instructor reserves the right to lower cutoffs)

**Academic Integrity:** I encourage you to work with classmates on assignments and you will be working with partners for some experiments. However, each student must turn in original work. No copying or sharing of spreadsheets will be accepted. Students who violate WSU's Standards of Conduct for Students may receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions

**Students with Disabilities:** Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information contact a Disability Specialist <http://accesscenter.wsu.edu>, or [Access.Center@wsu.edu](mailto:Access.Center@wsu.edu)

**Classroom Safety Information:** Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “*Alert, Assess, Act,*” protocol for all types of emergencies and the “*Run, Hide, Fight*” response for an active shooter incident. Remain *ALERT* (through direct observation or emergency notification), *ASSESS* your specific situation, and *ACT* in the most appropriate way to assure your own safety (and the safety of others if you are able).

Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the [FBI's Run, Hide, Fight video](#) and visit the [WSU safety portal](#).