

CHM 212  
Quantitative Analysis  
Laboratory Syllabus  
Spring 2017

**Instructor: Dr. Michael J. Prushan**

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**Lab: Thrs 9:30 – 12:20**

The aim of this laboratory course is to provide the student with experimental work which enhances the various topics covered in the lecture portion of the course. Experiments such as complexometric, neutralization and redox titrations will be performed. Other topics will include electrochemistry and pH electrodes.

As the course title indicates, the ultimate goal is to determine how much of a particular entity is contained in a sample. Therefore quantitative methods of preparing and handling solutions and reagents will be stressed.

**REQUIRED MATERIALS**

1. Safety goggles or safety glasses and a lab apron **MUST** be worn at all times. (available in the stockroom)
2. All of your data will be collected in a black composition notebook.

**ATTENDANCE**

All students are required to be present for the start of the lab at 9:30, as this is when the theory and techniques of the laboratory experiment will be explained and demonstrated. The student should attempt to keep pace with the laboratory schedule as extra lab time will be limited. Should you find it necessary, for any reason, to miss a lab, it would be helpful to notify the instructor.

**LABORATORY GRADE**

The lab portion of the course will contribute 30 % to your overall grade and will be determined by computing your numerical grade according to the following:

NOTEBOOK AND LAB REPORT (includes accuracy)	25%
INSTRUCTOR EVALUATION OF TECHNIQUE	5%

For the laboratory portion of this course you will be required to maintain a record of your activities in the black composition Laboratory Notebook that I have provided. One of the first things that you should do is number each page of the notebook using only one side of each page. Then reserve the first four pages for a Table of Contents. The data collected in this Laboratory Notebook will then form the basis for your Final Laboratory Report (see Laboratory Notebook and Final Lab Report handout).

Before you come to lab, you must enter the Title and Purpose of the experiment into the Laboratory Notebook. Any required calculations needed for the experiment NEED to be completed in your lab notebook before coming to lab. You will given a ZERO for the experiment if the calculations are not completed before starting the experiment. It will also be helpful to set up any data tables or charts in your lab notebook. This material will be checked during each experiment. At the conclusion of the days work, I will initial your Laboratory Notebook.

Your Final Lab Report **must** be typewritten. All chemical structures are to be drawn with the KnowItAll software package.

After you have finished the experiment, you will complete the Final Laboratory Report in which you organize all your data and present your results. You will also answer any questions that may be included in the "Include in the Final Laboratory Report" section. You should also check your final value with the instructor to find out if it is too high or too low. Then analyze what factors would lead to the error in your value. The Conclusion section should briefly summarize the goal of the experiment and state whether it was achieved or not. It should also state the results of the experiment.

Good writing is essential. Lab Notebooks and the Final Lab Reports must be grammatically correct and comprehensible; otherwise they will not be accepted.

Laboratory reports are due one week from the last scheduled date of the experiment.

**Academic Integrity:** It is your responsibility to maintain a high degree of integrity in your work. Cheating of any kind will not be tolerated and will result in a failure in the course! The following are considered cheating: (a) Sharing of results and answers on lab reports, graded assignments, quizzes and exams; (b) Use of unauthorized materials during an exam; (c) Plagiarism, including copying a fellow student's lab report or homework.. When in doubt, both parties involved in plagiarism (both the copier and the copyee) will be held responsible for the integrity violation. Please refer to the school's official Academic Integrity Policy for further information.

**No Late Lab Reports will be accepted!!**

**Please note that in order to pass the course, you must receive a passing grade in both the lecture and laboratory parts of the course.**

CHL 212  
Quantitative Chemical Analysis Laboratory  
Spring 2017  
Schedule

I hear and I forget. I see and I remember. I do and I understand. –Confucius

Lab Check-in	Jan. 20 <sup>th</sup>
<b>Experiment 1:</b> Calibration of Volumetric Glassware	Jan. 26 <sup>th</sup>
<b>Experiment 2:</b> Measurement Statistics – M&M Statistics	Feb. 2 <sup>nd</sup>
<b>Experiment 3:</b> Preparation of an NaOH Standard Solution using Direct Titration	Feb 9 <sup>th</sup> and Feb 16 <sup>th</sup>
<b>Experiment 4:</b> Activity of Solutions	Feb 23 <sup>rd</sup>
<b>Experiment 5:</b> Determination of Aspirin using Back Titration	March 2 <sup>nd</sup>
<b>NO LAB</b> <b>SPRING BREAK</b>	March 9 <sup>th</sup>
<b>Experiment 6:</b> Potentiometric Titration of an HCl-H <sub>3</sub> PO <sub>4</sub> mixture	March 16 <sup>th</sup>
<b>Experiment 7:</b> Determination of Water Hardness Using Complexometric Titration	March 23 <sup>th</sup>
<b>Experiment 8:</b> Redox Titration of Vitamin C	March 31 <sup>st</sup>
<b>NO LAB</b> <b>AWAY AT AMERICAN CHEMICAL SOCIETY (ACS MEETING</b>	April 6 <sup>th</sup>
<b>NO LAB</b> <b>EASTER BREAK</b>	April 13 <sup>th</sup>
<b>Experiment 9:</b> Reference Electrodes and Cyclic Voltammetry [please sign up for the second part of this experiment]	April 20 <sup>th</sup> and April 27 <sup>th</sup>
Lab Check-out (and finish up day if needed) <b>All reports due by 3:00 pm.</b>	May 4 <sup>th</sup>