CH111 General Chemistry Laboratory - Syllabus
Prof. Marcus D. Lay

Contact Information
mlay@cooper.edu; (212) 353-4375; Room 415. Office hours: To be announced.

PLEASE BE PROMPT. Being late will affect your grade, as described below. Prelab sessions are held in room 106; lab meets in room 404.

Course Description
Methods of quantitative analysis are used to explore chemical reactions and analyze unknowns. Modern chemical instrumentation as well as analytical techniques and "classic" wet chemistry are covered. Statistical analysis of the experimental data is used to analyze results. Chemical laboratory safety and industrial chemical regulations are covered, as are the fundamentals of writing a technical report.

Course Web Page
http://moodle.cooper.edu ; register for Prof. Lay's section.

You will be uploading all of your lab reports to Moodle. **All of your reports must be submitted in MS-Word (or MS-Word compatible) format.**

Plagiarism
You may not consult with other students or alumni, or review other students' lab reports, when preparing your lab report. The sole exception to this rule is your own assigned laboratory partner. You may not share data or copies of your lab reports with anyone, and you may not read or copy old lab reports or lab reports written by others. You may not use data generated by other students in your lab reports unless I give you written permission to do so. The sole exception to this rule is, again, your assigned laboratory partner.

Plagiarism penalties range from receiving a grade of 0 for the entire experiment to receiving an F in the course depending on the circumstances. All incidents of plagiarism will be reported to your advisor, your department chair, the Dean of Engineering, and the Dean of Students and referred to them for further action which may include suspension or expulsion from the Cooper Union.

Do your own work and all will be well.

Materials Necessary for Laboratory

- **SAFETY GOGGLES**. Regular glasses (even with safety lenses) are not acceptable, nor are safety glasses (which do not offer complete side, top and bottom protection). Safety goggles may be purchased at a variety of hardware stores. You must wear these in lab at all times, even when you are not working. You will not be allowed to work if you do not have goggles on your face.

- The **Cooper Union General Chemistry Laboratory Guide.**

- A **laboratory notebook** with sewn-in pages for recording your data. Each student must have and use their own laboratory notebook.

- **Textbook**: *Fundamentals of Analytical Chemistry: 9th Ed.* (Skoog, West et.al.). You may use an older edition if you like (but no older than the 6th edition).

- **A USB flash drive.** One of the experiments will require you to collect data in electronic form and analyze it later.

Policy on Absences
Please note that all students must personally carry out all of the required laboratory work, and turn in reports on all experiments, in order to receive a passing grade (D or higher) for the course. **Absolutely no exceptions to this rule are permitted.**

Attendance is mandatory for all lab sessions, but some absences are unavoidable. You must email me or call me in advance, when possible, in order for the absence to be excused. You must also contact your lab partner.

Only excused absences will allow you to make up any required laboratory work, and arrangements for this must be made with the professor. Some absences may require documentation or coordination with the Dean of Students and the Dean of Engineering, at my discretion. No medical documentation will be accepted from a parent or relative. You may need to complete the experiment without a lab partner if you are absent from lab.

You are expected to do all of your work within your scheduled lab period.

Students are not allowed to work in the laboratory without direct faculty supervision. Cooper Union prohibits students from working in any laboratory unless an NYFD-certified individual is available to supervise the students. All students must pass the safety quiz before working in the lab.

Grading Policies
• 20% of the final grade is based on your pre-lab preparation and your notebook.
Pre-lab preparation includes, but is not limited to, the following:

1. **A summary of safety, health and handling information** must be recorded in the laboratory notebook for ***every*** reagent to be used throughout the upcoming experiment. This must be done before entering the laboratory. Students who do not complete this portion of the preparation will not be allowed to start work until the information is recorded in the lab notebook. This is for your safety, and no exceptions will be made under any circumstances.
2. **Tables for all data to be collected in the entire 2-3 week long experiment must be designed and printed in the lab notebook before the experiment is started.** The reason for this step is to ensure that all necessary data will be taken and properly recorded during the allotted time for each experiment.

3. **A brief outline of the procedural steps to be completed. Minimally this must outline the procedure to be followed during the current lab session.** This helps you to understand and prepare for what is to be done. Questions about the procedures should be asked before the lab period begins.

   Items 1-3 will be checked and evaluated at the start of each experiment. Periodically (without warning) I will inspect your notebook to ensure that you are maintaining it in a professional manner. Keep the following minimum standards in mind:

- ✓ **Make sure the notebook has your name on it.**

- ✓ Use a pen, not a pencil, to make entries in your lab notebook.

- ✓ All data in your notebook must match the data in your lab reports.

- ✓ Data is rejected by writing a single line through it and noting the reason(s) for rejection: never use 'white-out' or other methods to obliterate the data entry.

- ✓ All pages must be numbered. Leave a few pages at the front for a Table of Contents so that you can find things quickly and easily.

- ✓ **Data is usually entered on a separate, dated and numbered page. DATA IS ENTERED DIRECTLY IN THE NOTEBOOK - IT IS *NEVER* RECORDED ON A SCRAP OF PAPER FOR LATER TRANSFER TO THE NOTEBOOK.**

I very strongly recommend that **all calculations leading to the final result(s) be worked out in advance.** Because you will be analyzing materials whose exact composition is unknown (to you), devising a sample calculation (i.e., a representative calculation) showing all computation necessary to produce the final result will make writing the report a lot easier and, more importantly, ensure that you understand what you are doing and why you are doing it.

•40% of the final grade is based on your reports.

All reports must be joint reports co-authored by you and your lab partner, unless you are otherwise given permission. Lab partners will be assigned for each experiment.

All reports must be submitted electronically in a single file for each report (MS-Word compatible format). The required elements of the document's style are described in the lab manual. The report will be no longer than 20 double-spaced pages; late penalties will be imposed (-10% for each day late). Unless otherwise specified by your instructor, the reports are due one week after completion of the experiment. The reports are not meant to be grueling. I want nothing more (or less) than a readable, straightforward account of what you did and how you did it.

There is a mandatory Excel tutorial that must be completed before submitting your third lab report (or you will receive a 10% penalty on the report grade). This tutorial demonstrates the minimum standard I expect for the preparation of data plots. If you have completed the tutorial for another course (CH 160), just upload your file from last time.

•20% of the final grade is based on an interaction evaluation.
A student will receive 100% of these points if that student is always **on time for the lab**; **works conscientiously, safely and efficiently in the lab; wears safety goggles and appropriate clothing; cooperates with the instructor, staff, and fellow students; and finishes all work on time.**

• 20% of the final grade is based on the accuracy and precision you achieve.

This reflects your degree of skill and consistency in the safe, effective and efficient performance of the experiment and manipulation of experimental apparatus and data. Accurate and precise results are easier to discuss than inaccurate and imprecise results; so there is ample motivation to do a good job.