

CHEM 3504-11A, Intro Environmental Chemistry Lab

(Fall-2021; W: 1:00 – 4:50 pm, Bolin 309, 323)

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Laboratory Manual: Purchase from the bookstore.

Date	Experiment
Aug. 25	<i>First Week, No class</i>
Sept. 01, 08	Statistical Analysis of Environmental Lab Data (Lecture)
Sept. 15	Orientation, Lab Safety and Check-in Exp-1: Statistical Analysis of Environmental Data
Sept. 22	Exp-2: Acidity & Alkalinity of Natural Waters (Part-I)
Sept. 29	Exp-3: Acidity & Alkalinity of Natural Waters (Part-II)
Oct. 06	Exp-4: Total Suspended Solid/Total Dissolved Solid*
Oct. 13	Exp-5: Water Hardness*
Oct. 20	Exp-6: Phosphate Content in Natural Waters*
Oct. 27	Exp-7: Spectroscopic Analysis for Iron in Natural Waters*
Nov. 03	Exp-8: Spectroscopic Analysis of Fluoride in Drinking Water*
Nov. 10	Exp-9: Determination of pH and Na ⁺ in Natural Water Using Ion Selective Electrodes*
Nov. 17	Check-out and Final Paper Examination

* These labs will be performed in pairs; Lab partners can ONLY share raw data while their lab reports must be finished INDEPENDENTLY.

REQUIREMENTS:

- **Safety goggles:**
Goggles must be worn at all times while anyone in the laboratory is doing experiment. No open-toed shoes are allowed in the laboratory. Wear lab coat or wear long-legged clothing.
- **A permanently bound lab notebook with consecutively numbered pages:**
Record all data and observation directly into the notebook in ink. You should NOT achieve neatness by transcribing data from a sheet of paper to the notebook. Never attempt to erase or obliterate an incorrect entry. Instead, cross it out with a single horizontal line and locate the correct entry as nearby as possible.
- **A lab manual:** read the assigned experiment and come prepared.

GRADING:

- **8 lab reports @ 100 pts each = 800 pts** (the lowest one will be dropped)
- **Five pop quizzes @ 20 points each = 100 pts**
Quizzes will cover the lab that you will be doing that day and the labs you had the weeks before. Therefore, always come prepared and do not forget what you learned previously. Always bring your calculator with you in the lab.
- **Final paper exam @ 200 pts = 200 pts**
- **Overall lab grade = (your total points ÷ 1100) x 100%**

MISCELLANEOUS:

- **Lab starts on time:** Therefore, 5 points will be subtracted from your lab grade for every 5 minutes you are late. *If you exceed 20 minutes, you will NOT be accepted in the lab and receive a zero for this lab.*
- **Safety first:** Any students not wearing goggles and/or wearing open-toed shoes will not be accepted in the lab and will receive a zero for that lab. Safety is one of the most important things in the lab. If at any time, you are not sure whether or not you are working safely, consult your instructor. There are no silly questions about safety, there are only silly accidents.
- **When and where to turn in reports:** Turn in the **carbon** copy pages of your lab reports on the following Wednesday when you come for the new lab. All the later reports will be docked 25 points per day late.
- **Pages containing the original data MUST be signed by your TA or instructor at the end of each experiment.**

Laboratory Notebook Format

The first few pages of the notebook are to be reserved for a table of contents which includes the date, title, and page of each experiment. Each experiment report must contain the following items:

1. **Title and Date.** This section gives the title of the experiment and the date that it was performed.
2. **Purpose.** This section is a paragraph or two to explain why you are doing the experiment (statement of the objective(s)).
3. **Chemicals.** This section includes any necessary reagents, their brands and quality.
4. **Equipment.** This section includes all but standard laboratory equipment. Brands and model numbers must also be given.
5. **Chemical Reactions.** You need to give a list of any important chemical reactions that will occur during the experiment.
6. **Procedures and Data.** This section includes a reference for the entire procedure. All procedures must be stated in your own words (preferably in outline format). Data and observations pertaining to a particular procedure must be entered immediately following that particular procedure. All data entries should be labeled and entered in a neat and orderly fashion. A table format should be used whenever possible. All data and observations are recorded at once in ink. Do not use scratch paper and then transfer the information. Any rejected data must include a short explanation.
7. **Results and Conclusions.** This section includes a list of any required statistical results (mean and standard deviation) plus a discussion of these results. The discussion might include how good or how poor you believe results to be, source of error, and so on. It might also include statement indicating what was learned from the experiment.

To earn credits for calculation, you must completely write out each type of calculation in an orderly fashion. Failure to follow this rule may lead to credit losing. Meanwhile, any measured quantities must be reported with appropriate units.

Lab reports not meeting the above lab notebook format are unacceptable and will earn a grade of zero for each section that is not appropriately completed.