

# Chemistry 116

## Honors and Majors General and Analytical Chemistry I

### NOTEBOOK Laboratory Reports

A notebook laboratory report is required for all laboratory experiments which is written or printed in your notebook (make sure the duplicate copy is legible by using the cardboard flap under the duplicate page). Plots and graphs will be computer generated. For experiments with a cover sheet, the fillable pdf form will be submitted. The report consists of three sections: 1) a prelab, 2) results/data from your in-lab work, and 3) a postlab analysis. Prelab questions/assignments are submitted before the lab period begins and original data is turned in before the lab session ends. Your final lab report submission, with original notebook pages, in the proper order consists of:

coversheet (when available)

PRELAB described below; prelab questions/assignments submitted before lab period

INLAB described below; notebook copy of data collected (in-person experiments) appended at end of report

POSTLAB described below

The report is submitted through Blackboard. The due date is one week after the final lab period for the experiment. Of the 20 points assigned to the lab report, 2 points are deducted per day the report is late.

The point distribution given below can vary for different labs: there is no INLAB data collection for an online experiment, the in-person labs with a cover sheet will include precision and accuracy assessments.

**PRELAB (6 pts)** checked by TA before experimental work begins; more detailed for online

1. **Prelab Questions:** answer any assignments/prelab questions in lab manual and submit before lab period begins
2. **Introduction to experiment:** an organized, original (not copied) and clear statement of goal of experiment, underlying theory or principles that will be examined, techniques employed, any useful equations, and the utility or importance of the results (~1 page for in person, ~3 pages for online which is more in-depth)
3. **Experimental outline:** complete list of activities (not copied from lab manual) with description of **major** experimental steps (weighing, dissolving, measuring, ...) **not** preparation steps (cleaning, drying, ...) - list can be in the form of a numbered outline (use phrases rather than complete sentences) or a clearly legible flow chart - make note of any special precautions; include important mathematical, physical, and chemical equations; list required physical constants. Use past tense and passive voice ("... solution was diluted by adding ...")

**INLAB (5 pts)** original notebook pages of data turned in to TA at end of lab session; copy of data turned in with report

1. **Data collected:** organized and complete presentation of all data obtained with correct metric unit and correct number of significant figures given for each physical quantity; data will generally be reported in the form of a table or graph (original notebook pages containing the data signed by and turned in to TA on day it is collected)
2. **Tables:** contain **recorded data only** (numbers and observations) with columns and rows clearly labeled
3. **Graphs:** prepared during the experiment, axes clearly labeled
4. **Calculations:** simple calculations performed during the course of the experiment to check that the procedure is being followed correctly and that the results make sense
5. **Observations:** succinct, complete, organized, clearly noted observations recorded during experiment

**POSTLAB (9 pts)** label all subsections

1. **Data analysis and discussion:** complete with calculations, formula given for each type of nontrivial calculation; calculations briefly explained before each step by applying general formula, for example:
$$d = \Delta m / \Delta V = (m_2 - m_1) / (V_2 - V_1)$$
each average quantity has a standard deviation having the same physical unit and number of decimal places as the quantity; error analysis performed (standard deviation, percent error); source of potential errors with discussion
2. **Tables, graphs:** titled, axes captioned with units; fitting of data to straight lines done by linear least squares regression with slope, intercept, correlation and standard deviations of slope, intercept, and fit given - computer generated graphs large enough to be easily read
3. **Questions:** posed in experiment/manual answered
4. **Conclusion (2 pts):** brief summary of findings with conclusions drawn - brief comment about purpose of experiment, results, errors, problems; as appropriate, suggest changes in procedure to improve experiment
5. **Connections (1 pt):** A **maximum** of one or two paragraphs describing/discussing the connection of the laboratory exercise with other components of the course, other courses, other areas, one's personal experiences, "real life".