CHEM 103W: General Chemistry

Middlebury College

Fall 2018

– Laboratory Syllabus –

Instructor: Prof. Mary Jane Simpson, MBH 429, msimpson@middlebury.edu, 802-443-5978

Office Hours: Friday 11 am - 12 pm and by appointment in MBH 429, Open Lab Study Hall: Tuesday 9 am - 11 am in MBH 563

I. Course Schedule

Date	Name of experiment	Due date	Assignment weight
Sept. 17, 2018	Lab 1: Significant figures, check in, and lab safety	Sept. 24, 2018	5 points
Sept. 24, 2018	Lab 2: Separation of a mixture	Oct. 1, 2018	8 points
Oct. 1, 2018	Lab 3: Spectrophotometric determination of iron	Oct. 8, 2018	10 points
Oct. 8, 2018	Lab 4: Deduction of a molecular formula	Oct. 15, 2018	12 points
Oct. 15, 2018	Lab 5: Emission of light, and tie dye	Oct. 22, 2018	15 points
Oct. 22, 2018	Lab 6: Sunscreen: absorption of UV light		
Oct. 29, 2018	Lab 6: Continued	Nov. 5, 2018	30 points
Nov. 5, 2018	Lab 7: Titration of citric acid	Nov. 12, 2018	15 points
Nov. 12, 2018	Lab 8: Identification of an unknown volatile liquid		
Nov. 19, 2018	Lab 8: Continued	Nov. 26, 2018	30 points
Nov. 26, 2018	Lab 9: Enthalpy of dissolution	Dec. 3, 2018	10 points
Dec. 3, 2018	Lab 10: Liquid nitrogen ice cream and check out	Dec. 3, 2018	5 points

II. Rationale

The laboratory portion of CHEM 103 introduces students to the scientific method, illustrate topics in general chemistry, and give students hands-on experience in a chemistry laboratory.

III. Learning Outcomes

By the end of this course, students will be able to:

1. Maintain safety in a chemistry laboratory;
2. Work collaboratively with a lab partner;
3. Follow instructions to complete a chemistry experiment;
4. Accurately record experimental data;
5. Generate novel experimental procedures, including choosing appropriate equipment;
6. Analyze experimental data with Microsoft Excel and other software;
7. Explain likely sources of experimental error;
8. Formulate logical conclusions based on experimental results;

IV. Format and Procedures

Supplies: The lab manual and worksheets will be provided online and in print, respectively at http://sites.middlebury.edu/chem103lab/. You need a pair of safety glasses. For the week of October 9, you will need a clean 100% cotton white t-shirt and/or any other 100% cotton white garments you would like to tie dye.

Safety: Everyone is responsible for maintaining a safe laboratory. Follow the safety rules at all times. Failure to follow lab safety rules will result in a significant participation grade penalty, which may be assigned without warning.

Grading: The lab counts as 25% of your final grade in CHEM 103. Grades are on a numerical scale out of 150 possible points. Points are awarded based on lab preparation (5 points total), lab participation (5 points total), and lab worksheets (10 labs at 5 - 30 points each). *Late assignments will lose 1 point per day unless an extension is granted by the instructor. Unexcused late assignments received after an answer key has been released (typically one week after the assignment was due) will receive no credit.*

Attendance: Attendance is required in order to perform experiments and complete lab reports. Please arrive on time; pre-lab discussions are brief and provide critical information. *If you miss a lab, you must make it up promptly. Excused absences are eligible to receive full credit, but unexcused absences automatically lose 25%.*

Preparation: *Read through the lab handout and complete the pre-lab portion of the lab worksheet* prior to arriving to lab. Your pre-lab assignment will be checked by the TA at the beginning of lab, but you can correct it during the pre-lab discussion. Plan on preparation taking approximately 1 hour each week.

V. Academic Integrity

Academic integrity is of utmost importance in chemistry lab: you must never falsify your data. You are encouraged to work together in and out of lab and to discuss your lab reports with other students, however, the assignments you turn in should represent your own work, in your own words, based on your own original data. If you use outside resources, then you must cite your sources appropriately. Each student in this course is expected to abide by the Middlebury College Honor Code. Suspected violations will be reported to the Office of Judicial Affairs.

VI. Accommodations for students with disabilities

Students with documented disabilities who believe that they may need accommodations in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. Assistance is available to eligible students through Student Accessibility Services. Please contact Jodi Litchfield at litchfie@middlebury.edu for more information. All discussions will remain confidential.

VII: Grading rubric for lab reports

	Full credit	**Partial credit**	**Minimal to no credit**
Objective	Accurate summarization of the goals of the lab written in complete sentences, and it is completed before coming to lab	Objective summarizes the procedure but fails to state the main goals of the lab, and it is completed before coming to lab	Objective is not complete before lab
Pre-lab questions	Answers are correct and were completed before coming to lab	Answers completed before coming to lab were initially incorrect, but they are corrected before submitting the lab	Pre-lab is not completed before lab; or, answers remain incorrect when lab is turned in
Procedure outline	All steps are shown with enough detail to complete the experiment without referencing the lab manual, and it is completed before coming to lab	Most steps are shown, but important details are missing; it is completed before coming to lab	Major steps are missing; or, procedure incomplete before coming to lab
Data collection	All data recorded clearly and completely	Data is unclear or details are lacking	A significant amount of data is missing
Calculations	Correct calculations with correct significant figures	Generally correct calculations with minor arithmetic or significant figure errors	Major errors in the approach to the calculations such as incorrect use of a formula
Conclusions	Complete, logical conclusion supported by the experimental results and outside research, if necessary	Incomplete conclusion such as results summarized without drawing any conclusions	Illogical and incomplete conclusion such as one not supported by experimental results
Error analysis	Correct answer with a correct, logical justification	Correct answer with an incorrect or illogical justification; or, incorrect answer with a logical justification	Incorrect answer with an illogical justification