

DEPARTMENT OF CHEMISTRY at GSU
PRINCIPALS OF CHEMISTRY I Lab
(CHEM 1211K – CRN 13511)

Spring 2018

Instructor: Lucien Lockhart

Office: 594 Kell (Get off elevator on 4th walk up or get off on 5th and walk down)

Office Hours: T 6 pm-7 pm. Any other time by appointment.

Email: llockhart1@student.gsu.edu

Laboratory Schedule: Thursday 3:00 pm – 6:00 pm

Pre-lab: 3:00 pm – 3:50 pm (PSC362)

Lab: 4:00 pm – 6:00 pm (PSC356/360)

Communication

- Please send emails to me **from** your GSU e-mail account, (e.g., jayz1@student.gsu.edu). Please put the course name in the subject of your email. (Do not email me from iCollege)

Class Goals

- To use best practices when it comes to laboratory safety and maintenance as you safely and effectively use proper glassware set-up, handling and disposal of hazardous chemicals and follow all experimental procedures.
- To learn essential techniques for lab courses and lab experimentation (recrystallization, filtration, titration and melting point determination) as well as to begin to discover best practices in problem solving in a laboratory environment.
- Gain an understanding of how to critically analyze experimental data in comparison to literature data.
- To learn the essential schemes in communicating your experimental results, drawing appropriate conclusions, and reassessing changes to future experimentation by writing a final report along with smaller reports during the semester.

Part I:

Experiment: Determination Density of an Unknown Liquid

Equipment: Graduated cylinder, pipet, buret, one-place balance, four-place balance (analytical balance)

Part II: Identification of an Unknown Organic Acid

Experiment 1 (purification): Recrystallization of an Organic Acid + Determination of Percent Yield

Experiment 2: Determination of Melting Point of the Organic Acid

Experiment 3: Determination of Equivalent Weight

- a) Preparation of ~0.1 M NaOH
- b) Titration of HCl with NaOH

- c) Titration of potassium acid phthalate (KHP) with standardized NaOH
- d) Titration of unknown organic acid with standardized NaOH
- Experiment 4: Comparison of Results Using a Computer Search
- Experiment 5: Determination of pK_a of the Organic acid
- Experiment 6: Determination of Identity Using Sodium Fusion Techniques

Grading Scheme (from the lab notebook)

<i>Final Exam</i>	40*#
<i>Quality of Notebook (in ink)</i>	10*
Quizzes	15
<i>Density Report</i>	10*
<i>Final Report (Quality)</i>	25*#
<i>Identification of Unknown Acid (data in Final Report)</i>	10*
<i>Recrystallization and Yield Calc. MP (range and standards)</i>	20*
<i>EW, M, HCl, & NaOH w/error analysis</i>	35*
<i>Computer Search and Analysis</i>	5*
Sodium Fusion and pK_a	15
Additional Measurements	10
<u>Identification (Logic)</u>	<u>5</u>
TOTAL	200^ points

Note: Assignable points on each item are twice the credit so that students can receive more partial credit. For Example: Final Exam questions will be graded on an 80 points scale. The final score will be divided by two for actual credit. Thus, the total maximum assignable points of 400 is equal to 200 credit points.

*These eight starred items are **REQUIRED** to be completed before total points will be assigned.

#The Final Exam, Final Report and Notebook will NOT be returned to students. They will be available for viewing and discussion in the lab instructor's office. They may not be removed. After two terms, they will be destroyed.

^Lab Credit: 25% of total course credit; No formal "grade" for 1211K Lab will be recorded, instead, the students' credit based on a maximum of 200 will be combined with those of the lecture portion of the course and a Chem 1211K overall grade will be assigned.

Note: Uncompleted lab work (if excused) will result in the assignment of a grade of "I" if the student is passing the lecture portion, otherwise, a grade of "F" will be assigned.

Need to Know

- **Class Attendance:** Students are expected to attend all laboratory sessions both **prelab** and **lab** and sign in and out. Prelab lecture is **MANDATORY** and students will not be allowed to complete the lab that day, if this portion is missed. There is no allowance for an exemption from any chemistry experiment or chemistry quiz/assignment. If you are late for class, please enter through the back door. You must finish all labs by 15 minutes to the end of lab and exit at 6 pm.
- **Pre-lab Quiz:** There will be four quizzes during the semester. If you miss the lecture, you will not complete the quiz. **NO MAKE-UP QUIZZES ARE ALLOWED.**
- **Lab Notebooks:** Bound lab notebooks are required the first day of lab. All entries **MUST** be made in blue or black ink at the time the experiment is being carried out. TAs will sign and date only lab notebooks that have the essential information for lab. Notebooks guidelines will be covered fully in class on the first day, with gentle reminders throughout the semester.
 - Front of Book
 - Table of Contents (1 page)
 - Each Experiment
 - Left sides: Notes from pre-lab lecture with lab title and date
 - Right side
 - Date/Lab partner
 - Title (centered/underlined)
 - Purpose of experiment/small introduction
 - Experiment (briefly outline procedure, action verbs are your friends)
 - Experimental data (any drawn tables)
 - Calculation of results (show one sample calculation)
 - Conclusion at the end of the experiment (there may be several steps)
- **Electronic Calculators:** Students are required to have non-programmable scientific calculators available during every lab session.
- **Cell phones:** Cell phones are not allowed in any lab or lecture situation and should remain in your bag or purse. Use of these electronic devices creates a safety and validity of knowledge issue in the lab and lecture.
- **Safety glasses/goggles:** These may be purchased at the GSU bookstore, the Georgia Bookstore, and most hardware stores. Students who are unable or forget to bring their glasses may buy a pair from the Lab Coordinator by filling out a breakage form in the lab. Students who obtain glasses in this manner will pay for them at the time they check-out of the lab. Safety glasses/goggles must be worn at all times. Students will not be allowed into the lab without their glasses/goggles.
- **Students must bring safety glasses/goggles and closed toe shoes on the **FIRST** day of lab for check-in.**
- **Lab Safety:** Failure to follow safety procedures will result in expulsion from that lab session with no make-up allowed and loss of credit.
- **GSU ID:** For all quizzes, exams and final lab report, a GSU ID must be provided.
- **Final Exam and Report:** The final exam and final reports will not be returned. They will be available for review in the instructor's office. These grades will not appear in iCollege. Students are required to take a closed book Departmental

Laboratory Final Exam to receive a passing grade in the course. **NO MAKE-UP LABORATORY FINAL EXAM WILL BE GIVEN.** Students are not allowed to share calculators during exam.

Chemistry Departments Student Integrity Policy: The Department of Chemistry follows the University policy on academic honesty published in the “Faculty Affairs Handbook” and the “On Campus: The Undergraduate Co-Curricular Affairs Handbook”. All tests taken must represent the student’s individual, unaided effort. To receive or offer information during any examination will be considered cheating. Any suspected offense may be referred to the Department’s Chair for appropriate action.

Class will never be cancelled unless an official from the Chemistry Department gives the class personal notification. Don’t assume a note to be enough without checking the Department’s office.

The University requires that faculty members must, on a date after the mid-point of the course to be set by the Provost (or his designee)

1. Give a WF to all students who are on their rolls but are no longer taking the class and
2. Report the last day the student attended or turned in an assignment.

Students who are withdrawn may petition the Departmental Chair for reinstatement into their classes.

NOTE:

*Students with Disabilities: Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which an accommodation is sought.

*A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent for the observance of a religious holy day shall be allowed to take an exam or complete an assignment scheduled for that day within a reasonable time after the absence.

*Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, please take time to fill out the online course evaluation.

*Deviations from this syllabus may be required.

Class Schedule

Day	Lecture/Laboratory	Assignments Due
1: 01/18/2018	Introduction, Safety Video / Check In Procedures	
2: 01/25/2018	Density and Equipment Notes / Density	Lab Safety Quiz
3: 02/01/2018	Purification and Density Calculations / Recrystallization	
4: 02/08/2018	Background on MP, Lab Technique / Melting Point Experiment	Density Report Due Quiz 1
5: 02/15/2018	Titrations / Standardization of NaOH (KHP experiment)	
6: 02/22/2018	Titrations (cont) / Titration of HCl	
7: 03/01/2018	Equivalency / Equivalent Weight Determination	Quiz 2
8: 03/08/2018	Validation/Verification of Results / Computer Search	
9: 03/22/2018	Discuss issues/Other labs / pKa	Quiz 3
10: 03/29/2018	Discuss issues/Other labs / pKa cont	
11: 04/05/2018	Discuss issues/Other labs / Sodium Fusion test	
12: 04/12/2018	Wrap up / Complete remaining labs	Quiz 4
13: 04/19/2018	LABORATORY FINAL EXAM	

IMPORTANT DATES:

- First lab day is on Thursday, January 18, 2018
- Last Day to Withdraw is Tuesday, February 27, 2018
- Spring Break is March 12-18, 2018
- Lab Final Exam is Thursday, April 19, 2018