

**CHEMISTRY 1211K LABORATORY SYLLABUS**  
**Spring 2019**

**Instructor:** *Dr. Jyotsna Thota*

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*(Send emails from your GSU email account and write the course number in the subject line)*

**Office hours:** T 11.30 AM – 1.30 PM

**Lab Meetings:** 10.00 AM – 1:00pm every Wednesday

**Pre-Lab Lecture:** W 10:00 am – 10:45 pm, PSC 362

**Lab:** M 10:45 am – 1:00 pm, PSC 355

**Text/ Lab Manual:** The Identification of an Organic Acid (distributed first day in lab)

**Laboratory Materials Required:** A stitched and bound notebook, and safety goggles or glasses. Lab fees paid to the university cover the laboratory manual and expendable supplies used in the lab throughout the semester. Replacement cost for broken or lost glassware/chemicals are due at end of the semester.

**Schedule of Activities and Grading:** The schedule of the lab experiments and the grading scheme is in the lab manual & below. Except for the first experiment on density, the rest of the lab activities are designed as an INDIVIDUALIZED STUDENT PROJECT that will continue throughout the semester and involve purification and identification of an unknown organic acid. Data will be recorded in lab notebooks, and data report sheets will be submitted to the instructor on specified dates. Details are given in the lab manual and during the pre-lab lectures.

**Examinations and Reports:** There will be **quizzes** during the semester, and a full length **comprehensive final examination** (on the last day of lab, Dec 3<sup>rd</sup>). A **report on the density of the unknown liquid lab**, and **data sheets** on **melting point, %Yield of recrystallization unknown and unknown solid acid**, standardization (**molarity**) of **aqueous NaOH** solution prepared by student, **molarity of aqueous HCl** provided to student, **equivalent weight of pure unknown solid acid** and **computer search** will be submitted to the instructor on specified dates during the semester. Points (10% per day) will be deducted for late reports and data sheets.

A **FORMAL COMPREHENSIVE FINAL REPORT** and the **LAB NOTEBOOK** will be submitted to the instructor at the end of the semester. Lab drawer checkout is required by this date or sooner to avoid an additional fee (including students who withdraw).

**Class Preparation and Attendance:**

Any student who does not attend the first two lab sessions cannot attend lab that semester. This student must drop the course since the lab is an essential part of the course

**Students are expected to attend EVERY prelab lecture and lab session (10:00 am - 1:00 pm). If the Pre Lab is missed, the student will not be able to do lab that day, with NO Makeup.** Please arrive on time, do not leave during the lecture. Students who are repeatedly late or absent will have points deducted. **Students are individually responsible for the timely completion of all assignments (experiments and reports), absence being no excuse. After a student misses two labs, every lab missed after will result in a 5% (10 point) penalty.**

Periodic **pop quizzes** will occur at the **start of pre-lab** to evaluate preparedness for the day's experiments. Lab notebooks will be checked throughout the semester, at start of pre-lab for preparation and at end of lab for experiment completion. **Do not assume that extra time will be allowed if you fall behind.** A **maximum of one excused absence** may be made up, after midpoint with instructor's written permission and ONLY if room is available in another lab section.

#### **To succeed in lab:**

1. Come **prepared** each day by reading the next assigned experiment and completing experiment title, objective, and procedure in your notebook before you come.
2. Be **self-reliant**. Pay attention in pre-lab and write down notes given on the board, so that you can refer to these while doing the experiments. Socialize outside of lab.
3. Be **efficient** in lab so that you can complete hands-on experiments in a timely manner. Record all data, pre-lab notes, calculations DIRECTLY in your lab notebook in INK; do not record data on random pieces of paper that can be easily lost.
4. In lab, learn how to do the **calculations**; these need be **finished at home** and should be brought completed (in your lab notebook) to the next lab meeting (this is lab homework).
5. At the end of each day, in your notebook jot down **where you stopped** and where you **need to start next time**. At the end of each experiment, record your **conclusion** (example: have pure crystals, melting point of acid is \_\_\_ °C, average molarity of NaOH is \_\_\_ M, equivalent weight of acid is \_\_\_ g/mol, pKa of unknown acid is \_\_\_).
6. It is in your best interest to **complete experiments** and submit the data sheets by the assigned day, so that you can receive feedback on your progress and keep up with the experiment. Points will be deducted for late data sheets.
7. Prepare for **quizzes**, which focus on calculations needed for experiment analysis.
8. **Start writing your final lab report before the end of the semester**, so that there is time for feedback. A complete, **well organized notebook** will make the task of writing a good final lab report much easier.
9. Chemistry Department lab policies are at: [http://chemistry.gsu.edu/lab\\_policies.html](http://chemistry.gsu.edu/lab_policies.html)

**\*\*To pass the lab:** students MUST (1) **take the written lab final exam**, (2) **turn in a final lab report**, and (3) **turn in their lab notebook**. All this is **due on Dec 3<sup>rd</sup>** (during week 13) at the beginning of prelab lecture. It is important that students work on their lab report as experiments progress during the semester. **The final lab report cannot be written in one night.**

#### **Chemistry Department Student Integrity Policy:**

The Department of Chemistry follows the university policy on academic honesty published in "Faculty Affairs Handbook" and "On Campus: The Undergraduate Co-Curricular Affairs Handbook." All tests & quizzes taken & reports submitted must represent student's individual unaided effort. To receive or offer information during an examination will be considered cheating. Suspected offenses may be referred to the Department Chair for appropriate action. Classes 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 with the Department office (389 Petit Science Center).

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 those students who are on their rolls but no longer taking the class
2. Report the last day the student attended or turned in an assignment.

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

## TENTATIVE SCHEDULE OF EXPERIMENTS

DATE	LAB	CHEM 1211 LAB EXPERIMENTS
Jan 23	1	Check-in, Safety Video & Orientation, Desk & Unknowns assigned. Review safety procedures and equipment use. Wash all glassware in drawer.
Jan 30	2	<b>Task 1 Density of "Unknown Liquid Sample"</b> 3 parts to experiment, discuss error analysis, take safety test.
Feb 6	3	<b>Task 2 Purify "Recrystallization Unknown"</b> - <b>Submit "Density" Data Sheet</b>
Feb 13	4	<b>(B) Determine % Yield:</b> (i) Purified "Recrystallization Unknown" % Yield - <b>Submit "Recrystallization % Yield" Data Sheet</b>
Feb 20	5	<b>Task 3 --- Semester Project "Identify Organic Acid"</b> <b>Part 1 Melting Point</b> <b>Part 2 Equivalent Weight of Unknown organic acid</b> i) Prepare NaOH solution and titrate with KHP to determine molarity of NaOH - <b>Submit "Melting Point" Data Sheet</b>
Feb 27	6	ii) Obtain ~0.3M HCl solution (record Carboy No.) and titrate with NaOH to determine molarity of HCl <b>Complete calculations at home!!!</b>
Mar 6	7	iii) Titrate unknown organic acid with NaOH to determine the <b>Equivalent Weight</b> <b>Submit "Molarity of NaOH &amp; HCl" Data Sheet</b> <b>Complete calculations at home!!!</b>
Mar 13	8	<b>Perform Computer Search</b> to find possible Identity of unknown organic acid - <b>Submit "Equivalent Weight" Data Sheet</b> - <b>Submit copy of Computer Search to Instructor &amp; keep a copy for your report.</b>
Mar 27	9	<b>Part 3 pKa titrations of unknown organic acid with NaOH using pH meter.</b> - <b>Graph Titration Curve at HOME in Excel &amp; bring plots (hardcopies) to Lab.</b>
Apr 3	10	<b>2<sup>nd</sup> &amp; 3<sup>rd</sup> pKa titration of organic acid with pH meter</b> for different % EtOH solvents. <b>Finish pKa titrations of organic acid with NaOH using pH meter</b> at different % EtOH. - <b>Submit Sample for Sodium Fusion Test</b> to identify N, Cl, Br, I - <b>Graph Titration Curve at HOME in Excel &amp; bring plots (hardcopies) to Lab.</b> - <b>Determine pKa value in pure H<sub>2</sub>O from pKa titration graphs &amp; %EtOH correction plot</b>
Apr 10	11	<b>Finish Sodium Fusion Tests</b> to identify presence of N, Cl, Br, I.
Apr 17	12	<b>Make-up Lab, Clean-up and Checkout.</b>
Apr 24	13	<b>Take Final Exam, Submit Lab Notebook and Final Lab Report**</b> <b>(with summary data sheet) Clean-up and Checkout. **Required to Pass Lab</b>