DEPARTMENT OF CHEMISTRY

Principles of Chemistry I Lab (CHEM 1211; CRN 50076)
Summer 2019

Instructor: Dr. Joan Mutanyatta-Comar
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Office hours: **WF**: 11:00 am – 1:00 pm. **Any other time by appointment.**

Pre-lab Lecture: **TR** 9:00 am – 9:45 am**. Natural Science Center (NSC) 218**
Lab: **TR** 9:55 pm - 12:25 pm. **Natural Science Center (NSC) 234**

Text: "The Identification of an Organic Acid" GSU Lab Manual
(Included in the price of supply card).

Communication:
Please send emails to me from your GSU e-mail account,
(e.g., jcole1@student.gsu.edu). Please put the course name in the subject of your email. (**Please do not email me from iCollege)**

List of Experiments:

Part I:
Experiment: Determination of 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: Recrystallization of an unknown organic acid + % yield determination
Experiment 2: Determination of melting point of the unknown 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: Computer search
Experiment 5: Determination of pKa of the unknown organic acid
Experiment 6: Sodium fusion

Learning outcomes: Students in this class will:

- Demonstrate the ability to safely and effectively perform various experiments using proper glassware set-up, handling of hazardous chemicals, and following the prescribed experimental procedures.
- Demonstrate mastery of basic chemistry laboratory techniques, including recrystallization, filtration, titration, and melting point determination.
- Gain an understanding of how to critically analyze experimental data in comparison to literature data.
- Demonstrate their ability to effectively communicate scientific results by writing a final report.

Grading: (taken from the GSU lab manual)	Max. Credit
Final Exam	40*#
Quality of Notebook (in ink)	10*
Study Questions and Quizzes	15
Density Report	10*
Final Report (Quality)	25*#
Identification of Unknown Acid (data in Final Report)	10*
Recrystallization and Yield Calc. MP (range and standards)	20*
EW, M, HCl & NaOH w/error anal.	35*
Computer Search and Analysis	5*
Sodium Fusion or Amide or pK_a	15
Additional Measurements	10
Identification (Logic)	5
TOTAL (Maximum)	200^

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 & lab notebook will NOT be returned. They will be available for viewing and discussion in the lab instructor's office. They may not be removed. After two semesters, 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.

Notes:

1. **Pre-lab and lab are a single unit, for safety and operational reasons pre-laboratory attendance is mandatory. Any student who misses pre-lab will not be allowed to attend the laboratory session for that day. Students who miss more than two labs will get a 5% penalty of the overall lab grade for each absence over two.**
2. Attendance to **pre-lab lecture** and **lab** will be recorded (sign-in/out of lab required). Absences can result in loss of points and lower grades.
3. **Bound Lab notebooks** are required the first day of lab. All entries **MUST be made in ink** at the time the experiment is being carried out. Notebooks must be submitted with the Final Report. **Please see lab notebook format in the lab manual.**
4. **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.
5. Students must bring safety glasses/goggles and closed toe shoes on the first day of lab for check-in.
6. Failure to follow safety procedures will result in expulsion from that lab session with no make-up allowed and loss of credit.
7. Final Report and Final Exam grades will not be posted on iCollege. But you can come and see your report and exam in my office.
8. Final letter grades are only available on PAWS/GoSolar. They will not be posted on iCollege. Please note that grades cannot be given to students by phone, or email.
9. **No make-up for Final Exam**

Important Dates:

June 11th	Lab begins
July 5th	Last day to withdraw with grade "**W**"
July 4th	Holiday
July 23rd	**Final Exam; 9:00 pm – 10:00 am (Tuesday)**

Class Preparation and attendance:

- ✓ Students are expected to attend all laboratory sessions.
- ✓ Every effort should be made to arrive on time, as important pre-lab advisories will be given at the start of each session.
- ✓ The student is individually responsible for the timely completion of all assignments, regardless of any reason of absence.
- ✓ Reading assignments, which will be given in lecture, should be completed prior to the following lecture and will constitute the quiz material.

Keys for success in a chemistry lab:
Students who do well in this course possess the following characteristics:

- **Attend pre-lab lecture and lab:** There is a very good correlation between class attendance (on time) and how well a student will do in this course.
- **Are prepared:** You will get the most out of class if you have reviewed the experimental procedures before coming to each pre-lab session, please see tentative schedule on the next page.
- **Ask questions:** If you don't understand something, ask the instructor in class, during lab, after class, or during office hours.
- **Collect all graded quizzes and homework**. They go over the questions they got wrong and ask the instructor for clarification. This way they don't make the same mistake again.

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.

Tentative Laboratory Schedule

The lab/lecture schedule listed in the GSU, Chemistry Department laboratory manual will be adhered to as far as is possible. Below is a detailed, tentative schedule.

Pre-lab Lecture & Lab Dates	**Tentative Pre-lab Lecture Emphasis and lab work**	**Reading Assignments: Read the experiment in the lab manual before the next lab session**
June 11	Objectives of the course, Safety Video, Check-in	Determination of Density of an unknown liquid. Watch videos sent to your email (how to use a graduated cylinder, a pipet, a buret, and an analytical balance).
June 13	Safety Exam, Determination of Density of an unknown liquid	Identification of Unknown Organic Acid: Recrystallization experiment.
June 18	Complete density experiment; Begin term project: Identification of Unknown Organic Acid: Recrystallization experiment.	Determination of melting point, calculation of %yield, determining solubility of an unknown acid.
June 20	**Submit density report**; melting point and %yield of recrystallized unknown. Melting point of unknown carboxylic acid and solubility of unknown acid.	Preparation of ~0.1 M NaOH Watch a video sent to your email: acid-base titrations Titrations: a) HCl with NaOH b) KHP with NaOH
June 25	Preparation of ~0.1 M NaOH Titrations: a) HCl with NaOH b) KHP with NaOH	Determination of equivalent weight: Titration of unknown organic acid with NaOH
June 27	**Quiz 1**[definitions (precision, accuracy, random errors, systematic errors, density), m.p, recrystallization, %yield calculation]. **Homework 1 Assignment** Determination of equivalent weight: Titration of unknown organic acid with NaOH	
July 02	Complete all titrations	Computer search
July 09	**Homework 1 Due** Computer search for possible identity of	pKa titrations

	your unknown organic acid	
July 11	pKa titrations	pKa titrations
July 16	**Quiz** (calculations: molarity of HCl, NaOH, calculation of equivalent weight) pKa titrations continued	Sodium fusion
July 18	Sodium fusion	Study for lab final; write final lab report
July 23	Lab Final Exam during regular lab lecture time. Submit Final Report and Lab Notebook Check-out	

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.**