

Chem 4000/6000 Lab Fall 2020

FUNDAMENTALS OF CHEMICAL ANALYSIS

Instructor: Doyle Barrow

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Office Hours: DBT Via Webex

Lab Time: **Thursday 5:30-8:45** SA 462 and 562

Text: GSU Lab manual (it is handed out at first lab lecture). A course outline, schedule of activities, grading, etc., is included in the lab manual. Additional materials supplied by the instructor.

GSU department of chemistry has asked ALL prelab lectures to be placed online. Students are required to watch and take notes before their lab section.

Learning Outcomes: For the topics solutions, laboratory concepts, experimental error, statistics and calibration curves, quality assurance, complex chemical equilibria and activities, acids and bases, titrations, UV spectroscopy there will be demonstration of an *intermediate* competence in the following areas:

Students will demonstrate an understanding for the purpose of problem solving, predicting outcomes, explaining phenomena, and describing relationships.

Students will use quantitative reasoning for the purpose of *calculating numerical values* associated with problem solving, predicting outcomes, explaining phenomena, and describing relationships.

Students will demonstrate laboratory skills for the purpose of collecting, interpreting, analyzing, and reporting (in written form) chemical data.

Students will gather, interpret, evaluate, and communicate data correctly in writing and/or orally.

Students will operate common laboratory instruments used for chemical analysis

Students will describe and understand the capabilities and limitations of instrumental methods

Students will be able to the instrumental components and principles of operation

Required Laboratory Materials:

- 1) A stitched and bound notebook; no spiral notebooks, no tear-out pages
- 2) Safety goggles or glasses. You may purchase them from the lab coordinator

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Attendance:

Students are expected to attend each lab session. Arrive on time. Keep cell phones OFF. All notes are to be entered in notebook. Pictures are encouraged but cannot substitute notes.

GSU is following CDC guidance and every classroom will be at 25% capacity. Students will be split into 4 groups please see icollege or email for your group. Only attend on days your group is scheduled.

Lab Experiment Schedule:

Unit 1: Error and statistic analysis;

Aug 27 th	Group A Rm 462	Group B 562	Group C and D Home
Sept 3 th	Group C Rm 462	Group D 562	Group A and B Home

Unit 2: Acid-base titration: standardization of prepared HCl and NaOH solution; determination of the acid mixture composition of HCl + HAC;

All groups will receive data for standardization of NaOH. You must complete this before your laboratory section.

Sept 10 th	Group A Only	Rm 462
Sept 17 th	Group B Only	Rm 462
Sept 24 th	Group C Only	Rm 462
Oct 1 st	Group D Only	Rm 462

Unit 3: Titration of phosphoric acid w/ and w/o Mg²⁺; the effect of metal ion existence on acid titration (multiple-equilibria);

Data given to all groups online

Unit 4: EDTA standardization; metal-EDTA complex titration; determination of the metal ion mixture composition.

Oct 8 and 15th Group A

Oct 22 and 29 Group B

Nov 5 and 12th Group C

Nov 19th and Dec 3 Group D

Grading/Requirements:

Four papers will be written using real data obtained in each corresponding laboratory section. The papers will be returned with comments and students will be allowed to re-write, revise and re-submit the paper within one week from the date of paper returning, together with old original papers (please submit all copies) according to the following schedule:

- Students will be able to re-submit paper #1 twice and paper #2 once. No resubmission is accepted for paper #3 and #4. The score's from your first submission is very important because it reflects your independent work. The resubmission(s)

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addressing the comments/suggestions from your instructor could improve your score greatly, but only at 80% reduced scale (we encourage independence, critical thinking and beyond!). For example, if a student got 40 pts in an earlier submission and improved to 80 based on the grading criteria, the grade from the resubmission will be $40 + (80-40) \cdot 0.8 = 72$ (instead of 80 for those who put in significant efforts to get 80 independently). The highest score is counted as the final grade for each corresponding paper. Students are required to write each paper independently, analyzing their own data and discussing accordingly. IT IS NOT PERMITTED TO USE OTHER PEOPLE'S DATA/DISCUSSION IN THE PAPER WITHOUT MENTION. If that happens, it will be considered cheating and zero score will be given on this paper.

- A past-due penalty will be given, 2 pts off for each past-due day. The past due penalty cannot be removed by resubmission; it will be deducted from the final best score.
- The total lab score is submitted to your class instructor who will determine the single grade for both the lab and class portions of your performance.

(No group work. No sharing data. You are responsible for the data acquisition independently unless instructed otherwise by the lab instructor.)

Safety Requirement:

- Safety glass or goggles must be worn at all times inside the lab.
- Dress appropriately: no open-toe shoes (flip-flops, sandals, crocks, etc.); no very short shorts/skirts.
- No food, drink, gum, etc. in the lab.
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Statements below reflect GSU policy or guidelines to maximize protection of students and faculty in classroom settings. If a student taking a fully online course becomes ill during the semester they should still contact their instructor if their illness impacts their ability to complete their coursework.

Face coverings:

Georgia State University and the University System of Georgia have mandated a face covering policy. Students are required to wear an appropriate face covering while inside campus facilities (classrooms, hallways, elevators, labs and in all other public spaces) because six feet of social distancing may not always be possible. Face coverings will be worn in addition to and not as a substitute for social distancing. Face coverings aren't required in one's own dorm room or suite, when alone in an enclosed office or study room, or in campus outdoor settings where social distancing requirements are met.

Anyone not using a face covering when required will be asked to wear one or leave the area. Repeated refusal to comply with the requirement may result in discipline through the applicable conduct code for students. Reasonable accommodations may be made for those who are unable to

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wear a face covering for documented health reasons. To request an accommodation, start with the Access & Accommodations Center Welcome Form found at How to Connect.

When you wear a face covering, you're protecting yourself, but equally important, you're protecting other members of the university community. You're showing you're taking responsibility for the welfare of those around you.

The [university's policy on face coverings](#) is available in the university policy library

I will be wearing my face mask in class this semester, and you are required to wear yours. I know that face masks may make some aspects of class more difficult. It will be harder for us all to project our voices and read each other's facial expressions. However, I am willing to sacrifice these elements since wearing a mask is one thing I can control to support the health and safety of our community. This is a new situation for all of us and if we start the semester off from a place of mutual understanding it will be easier for us all to get through this together. Be aware that wearing face mask is required by GSU and there is a penalty if you choose to not wear a mask. Our university community has a strong tradition of upholding the value of mutual respect; we therefore ask students to not engage in behavior that would be disruptive to class regarding this policy.

Assigned seats:

On the first day of in-person class, students should sit only in seats indicated by a blue GSU "sit here" label. Instructors will then create a seating chart. Students should sit in their assigned seats for each in-person class session. If a student becomes ill, the seating chart will help identify those who may have been in close contact.

Attendance policy:

Blended classes: The in-person portion of classes is essential to instruction. Attending the assigned in-class sessions is one of the best ways to support student learning and to allow you to connect with your instructor and classmates. The in-class sessions will enable you to ask questions and engage in class discussions and activities in a more-in depth and personal way.

Suggestion 1: Students are expected to attend their assigned in-person class sessions. Students may not attend a class session they are not assigned to attend. If a student develops a fever, cough or shortness of breath they should not go to class and should notify their instructor immediately. The student will work with the instructor to develop a plan to complete the necessary course content, activities, and assessments in order to meet the course student learning outcomes. The attendance policy for this class is in alignment with the "Policy on Class Attendance" in the Student Code of Conduct.

Students who are unable to attend classes in-person should work with their academic advisers to build a schedule of fully online classes. Students who need accommodations for a disability should contact the Access and Accommodations Center at <https://access.gsu.edu/>.

Student illness:

If a student develops a fever, cough or shortness of breath they should stay at home, not go to class or work, and stay away from other people. If a student becomes sick or is required to quarantine during the semester, they should notify their instructor as soon as possible. The student will work with the instructor to develop a plan to complete the necessary course content, activities, and assessments in order to meet the course student learning outcomes.

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Students in residence halls who report an infection will be asked to return home. For those unable to do so, GSU will provide a sequestered area that will allow residential students to isolate while infected.

Chemistry Department 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 and quizzes taken and reports submitted must represent the student's individual unaided effort. To receive or offer information during an examination will be considered cheating. Any suspected offenses may be referred to the Department Chair for appropriate action. Classes will never be canceled 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 (404-413-5500, PSC 383).

The University requires that faculty members must, on a date after the mid-point of the course to be set by the Provost (or her 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 the Department Chair for reinstatement into their classes

The course syllabus provides a general plan for the course; deviations may be necessary.”

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.”

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 accommodations are sought

Receiving a grade of “incomplete” – in order to receive an incomplete, a student must inform the instructor, either in person or in writing, of his/her inability (non-academic reasons) to complete the requirements of the course. Incompletes will be assigned at the instructor's discretion and the terms for removal of the “I” are dictated by the instructor. A grade of incomplete will only be considered for students who are a) passing the course with a C or better, b) present a legitimate, non-academic reason to the instructor, and c) have only one major assignment left to finish.

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Tentative Lab schedule

Week	Dates	Lab	Experiment	Report submission on
1	01/13	Check-in	Introduction, Syllabus	
2	01/27	Experiment-1	Statistical Nature of Data	
3	02/03	Experiment-1	Statistical Nature of Data	
4	02/10	Experiment-2	Proton Transfer Reactions	
5	02/17	Experiment-2	Proton Transfer Reactions	Lab Report #1 (2 revisions)
6	02/24	Experiment-2	Proton Transfer Reactions	
7	03/02	Experiment-3	Metal-Ligand Reactions	
8	03/09	Experiment-3	Metal-Ligand Reactions	Lab Report #2 (1 revision)
9	03/23	Experiment-4	Analysis for metals by complexation of metal ions with EDTA	
10	03/30	Experiment-4	Analysis for metals by complexation of metal ions with EDTA	Lab Report #3, 6000 students full report 4000 data only (NO revision)
11	04/06	Experiment-4	Analysis for metals by complexation of metal ions with EDTA	
12	04/13	Experiment-4	Analysis for metals by complexation of metal ions with EDTA	
13	04/20	Catch-up Check-out	Catch-up	Lab Report #4 (NO revision)
14	04/27		Final Submissions	