Chemistry and Biochemistry Department, Queens College - CUNY

CHEM 1131- General Chemistry I Laboratory (Spring 2024) Syllabus

Course Section and Code #: 2- M,W 2:30-5:10pm, Rem. 156

Instructor's Full Name: Srikanth Yesrathnam

Instructor's Email: Srikanth.yesrathnam32@login.cuny.edu

Instructor's Office Hour: M,W 5:30-6:30pm Remsen 156 or by Appt.

Textbook for the course: No charge to student and it is posted on course Blackboard.

Other required items: A lab notebook with carbonless copy pages is required for collecting your experimental data. In addition, a scientific or graphing calculator is required and can be purchased anywhere. Note that lab coat, safety goggles, and required glassware are provided upon check-in.

Pre-Requisite/Co-Requisite: CHEM 1134

Coordinator: Dr. Jianbo Liu

[Note: Students should contact their lab instructor for all lab-related questions.]

I. Laboratory Course Format: In-person

A. ALL In-person lab sessions will be held on Queens College campus in Remsen at your scheduled time and day. Lateness by more than 15 min. is counted as an absence.

B. Attendance is required. There is NO make-up for any missed laboratory experiment. A missed lab will receive no credit and will be dropped from final average calculation ONLY if your absence is excused by your lab instructor. Students who miss more than two lab experiments (excused or not) must drop the course.
Written documentation will be required for excused absences.

II. General Laboratory Rules

A. Always wear safety goggles.

B. NO short pants, skirts, open toe shoes are allowed; tie back long hair.

C. NO food, beverages, gum, horseplay, or unauthorized experiments allowed.

D. NO computer, tablet or cell phone use in the laboratory during class activities.

III. Laboratory Manual

A custom laboratory manual is used and is available free of charge, posted on Blackboard in the Content Section. You **must bring a printed** copy of the experiment write-up to the lab in order to complete the experiment. You will not be allowed to use electronic devices.

IV. Prelab Preparation AND Lab Reports

A. Prelab preparation is required for each experiment BEFORE you come to the lab. This includes reading the full experiment from start to finish in the lab manual and watching posted videos (if posted) on blackboard. **The Prelab write-up should include section**

IV C (1-4)*, listed below and must be initialed by the instructor before the lab experiment begins. You should review the safety protocols for each experiment. **You should complete the prelab questions posted on Blackboard before each experiment.**

B A completed typed LAB REPORT as per specified format is ALSO required for EACH experiment. **Lab reports must be uploaded to Blackboard by the end of the day of the subsequent lab session**. Late lab reports are strongly discouraged. They will receive a severe reduction in points (see section V(B)).

C. **Format of Lab Report (*Reflect Items that should be completed in the lab notebook before each lab, i.e., the Prelab write-up).**

*1. **Title/Cover page:** Include your name, section number, experiment title, AND date of the experiment. Experiment title can be copied from the syllabus or lab book.

*2. **Objective:** It should clearly specify the aim for that day's experiment. It most often starts with "To find", "To measure", etc. Example: "To determine the heat energy released by the neutralization reaction of hydrochloric acid and sodium hydroxide."

*3. **Introduction**: Explain concisely the chemistry of the experiment in your own word. Include any equations and other scientific and mathematical explanations; i.e., the theory.

*4. **Experimental Procedure:** A concise but complete summary of the steps, materials, and apparatus of the experiment.

5. **Data:** Include your original data, signed by the instructor; i.e., the "carbon copy" of measurements or observations you directly recorded during the experiment.

6. **Calculations and Results:** Show all work; If there is a repetitive calculation, you need to show the equation and its use only once; Include any tables, graphs or diagrams that may be required.

7. **Conclusions:** Summarize your final conclusions in this section.

8. **Discussion:** State whether results were good or bad, and reasons why, what may have affected them, and any potential problems with the experiment. Be brief but complete. There may be questions you must answer, based on the lab manual. Work them into your discussion. If you know your expected value from instructor or from reference sources, be sure to list the percent error and discuss experimental errors that can account for it.

9. **References:** Include the lab experiment write-up and other references, including those from the internet.

Finally, Lab Reports do not have to be excessively long, but they do have to cover all the important ideas of the experiment.

V. Grading: (Part A) Each lab is graded for 100 points distributed as follows - 10% Prelab Questions; 10% Prelab write-up in lab notebook; 60% Lab Report; 20% Performance in the Laboratory. Part A will be weighted 85% of your lab grade.

(Part B) A written comprehensive lab final will be administered during finals week. Check cunyfirst for the date. This part will be weighted 15% of final lab grade. The lab final will cover lab safety, and the contents that were covered during the entire semester.

Further,

A. Prelab will not be accepted after the lab session is over. If material for completing prelab questions has not been covered in the lecture, utilize the office hours of the lab instructor to get help with prelab activity. No excuses will be accepted.

B. ALL lab reports are due by the subsequent lab session. LATE reports are strongly discouraged, and they will receive a penalty as follows - 10% reduction with each delayed week; Lab reports will NOT be accepted after two weeks or the last lab class (i.e., Check Out Day).

C. Reports will be graded for conformance to the above-described format and checked for plagiarism. Introduction, discussion, and conclusions are expected to be your original sentences.

D. If you have attended all the labs without any excused absences, your instructor will drop one of the lowest grades when calculating the lab average.

The criteria for Performance in The Laboratory Experiments are as follows:

1. **Safety:** If you do not work safely, you instructor will deduct points at their discretion. **Eye protection and lab coat must be worn at all times in the lab**; penalty for failure to do so is a 0 (zero) for the day and/or dismissal from that day's lab with no possibility of make-up [Points will be deducted from your final grade for safety offenses at instructor's discretion]. You should also cover your nose and mouth by wearing a mask during your in-person labs. Safety shower, eyewash, and fire extinguisher locations must be noted. Chemical waste handling protocols must be observed; if in doubt, ask! Points will be deducted for unsafe practices or violations of waste protocols; You may be ejected from lab and receive a zero (0) for that day's work.

2. **Independence**: Your ability to work and think independently, as determined by your instructor.

3. **Efficiency and Effectiveness**: Your ability to efficiently accomplish the goals of the experiment within the lab time frame. This also includes the quality of your results.

There will be no extra credit provided at the end of the semester. An INC grade will not be given to a student to avoid an F or WU grade.

VI. Other Important Information

(i) If you drop the course, you must notify your lecture instructor in order to stay in the lecture. You must check-out ASAP! Otherwise, you do so at the normal time on the final check-out day. If you do not check-out, you will be charged a fine as listed in the stockroom.

(ii) On the check-in day, a combination lock will be issued to you.

(iii) You must have an approved laboratory notebook with carbonless copy pages (for example, ISBN 978-1-930882-74-4 or 978-1-617319-14-3; there are other acceptable ones), and use it to collect and document your data. You can check the availability at QC online bookstore. Do NOT take any notes on scrap paper.

(iv) **Code of Conduct**

A. Plagiarism- Plagiarism or any other forms of cheating is NOT tolerated and will be severely punished by point, other penalties, and/or referral to

the Chairman and the Dean; Any assignment involved will receive a grade of zero. Failure to appropriately cite a source of information may also be considered plagiarism.

B. Inappropriate Behavior, e.g., horseplay or off-color language, oral or written, will NOT be tolerated and may lead to expulsion from class and a grade of zero.

(v) Available accommodation for students with learning disabilities: Students with disabilities needing academic accommodation should register with the Special Services Office by emailing QC.SPSV@qc.cuny.edu. For more information about services available to Queens College students, visit the Office of Special Services website: https://www.qc.cuny.edu/studentlife/services/specialserv/Pages/default.aspx

(vi) Counseling Services are also available to any Queens College student. This office assists students with personal concerns that can affect their enjoyment of and success in college. Services are free and confidential. All sessions take place on Zoom or by Telephone, depending on student preference. To make an appointment, students should call 718-997-5420 and leave a message with their phone number and CUNY ID. They may also e-mail counselingservices@qc.cuny.edu

(vii) CUNY Policy on Academic Integrity: Academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion as provided at https://www.cuny.edu/about/administration/offices/legalaffairs/policies-procedures/academic-integrity-policy/

Schedule of Experiments

Week 1 **(6/30)** IN PERSON Check In, Safety Review, Discuss Syllabus, Take Safety Quiz.

A score of 80% or above on the lab safety quiz is required before working in the lab.

Safety Video Links: https://www.youtube.com/watch?v=9o77QEeM-68

https://www.youtube.com/watch?v=gi3DeFY0cfw

Week 2 (7/2) Exp. 1 Density

Week 3 (7/7) Exp. 2Hydrate

Week 4(7/9) Exp. 3 Precipitation

Week 5 (7/14) Exp. 4 Iron-Copper (II) Sulfate Redox

Week 6 (7/16) Exp. 5 Qualitative Study of Redox

Week 7 (7/21) Exp. 6 Copper Cycle

Week 8 (7/23) Exp. 7 Molar Mass of a Metal

Week 9 (7/28) Exp. 8 Solutions

Week 10 (7/30) Exp. 9 KHP Titration

Week 11 (8/4) Exp. 10 FAS Titration

Week 12(8/6) Exp. 11 Calorimetry I and II

Week 13 (8/11) Exp. 12 Heat of

Neutralization

Week 14 (8/13) Checkout

Week 15 (8/18) Lab Final Quiz

QUEENS COLLEGE OF THE CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

CHEMISTRY 1144 SUMMER 2025

Lecturer: Dr. Alexander Altman
Office hour: M, T, W, Th: 12:00 – 12:45 in Remsen 206

Welcome to Che 1144 where we continue our exploration of the world of matter. After our semester together I hope you will see the world around you from a different perspective, from the perspective of a chemist. I hope that you will grow beyond the mere memorization of definitions to the realization that each definition is a model used to classify and explain matter and its changes; that every equation is the mathematical manifestation of the way chemists quantify matter and its changes. Chemistry isn't about words and numbers, it's about stuff, the stuff we and the rest of the world are made of.

The best way to contact me is by email: alexander.altman@qc.cuny.edu I will usually respond the same day. (Email will not be checked between Friday afternoon and Saturday night.)

You will need to have access to Aleks. See more information in "Guide to Using Aleks"

Text: Overby; Chemistry, 15th ed, McGraw-Hill. You will get access to the eBook bundled with your access to Aleks. You can purchase a loose-leaf copy of the text from the publisher. (See the link in Aleks.)

Optional textbook: OpenStax College. (2019). *Chemistry*. OpenStax.
https://openstax.org/details/books/chemistry-2e/
Hardcover: ISBN-13: 978-1-947172-62-3 Paperback: ISBN-13: 978-1-59399-578-2
Digital: ISBN-13: 978-1-947172-61-6
License: by OpenStax is licensed under Creative Commons Attribution License v4.0

Other required items: You should make sure that Brightspace is operating appropriately on your tablet or computer. Students must make sure they login to Brightspace to check for course material and announcements and check their email that is associated with Brightspace.
Technical Support: Email Helpdesk@qc.cuny.edu, or call the Student Support Hotline (718- 9973000).

Recitation: Recitation meetings are a great way for you to build your chemistry problem solving skills. During the semester, each student is required to present solutions to at least one of the starred (*) recommended problems in the list below. Pick a starred problem that you feel you can comfortably present to the class. Be prepared to present the problem and its detailed solution to the class. Your instructor and the other students may dialog with you. Your instructor will then ask you a follow-up question based on the material in the problem you solved. These questions count towards your recitation grade. Your instructor may also answer any questions you bring up about the course material. Quizzes will also be given during the semester.

LECTURE SCHEDULE

Dates	Topic	Chapters
6/30, 7/1, 7/2	Intermolecular Forces and Liquids and Solids	11
7/3, 7/7, 7/8	Physical Properties of Solutions	12
7/9, 7/10, 7/14	Chemical Kinetics	13
7/15	Exam #1	
7/16, 7/17, 7/21	Equilibrium	14
7/22, 7/23, 7/24	Acids and Bases	15
7/28, 7/29, 7/30	Acid-Base Equilibria	16
7/31	Acid-Base and Solubility Equilibria	16
8/4	Exam #2	
8/5, 8/6, 8/7	Entropy, Gibbs Energy and Equilibrium	17
8/11, 8/12	Electrochemistry	18
8/13	Exam #3	
8/14	Open Chemistry Forum	All
8/18	Cumulative Final Exam	

As real life frequently happens, it may be necessary to change this schedule. If any changes are made you will be notified via Brightspace and email. Make sure the email you have listed in Brightspace is one that you regularly check.

Online Learning: A key ingredient in your success in this course is keeping up with the course material. The Aleks learning system is there to help keep you on track. Part of your course grade is based on your timely mastery of the topics assigned online. Please be aware of the dates of the knowledge checks and of the goal dates. **No extensions can be given for these dates.** (See the guide to Aleks posted in Blackboard for more information.)

NOTE: A grade of C or better in Chemistry 1134 and Che 1131 (or their equivalents) is a prerequisite for this course. If you completed the first semester of general chemistry at another school, please speak with me at the beginning of the semester to verify that you have taken the correct prerequisite course.

A simple scientific calculator is required for this course. It should be able to handle scientific notation, square and cube roots and logarithms.

Exams: Exams will be given in person on the dates indicated in the schedule. Make-up exams will not be given. If you are not physically able to take one of our exams at the assigned time, contact me as soon as possible.

Academic Integrity: Students are expected to maintain the highest standards of academic integrity in all aspects of the course. I strive to assess every student's mastery of the course material fairly and accurately. I assume everything submitted by you represents your knowledge of the course material. If that isn't true, it is impossible for me to do my job. I am sure that most of you are honest, hard-working students who appreciate the fact that grades are based on student achievement and that those few who attempt to get by dishonestly will not succeed. Any violations will be treated seriously. For example, any violations observed during an exam can result in the student receiving a zero for that exam as well as disciplinary action from the College.

Suggested Questions and Problems from Overby; Chemistry, 15th ed.
I will not be teaching you every topic in the textbook, and you are only responsible for the material that I teach you. This list of questions and problems reflects the material that I plan to cover this semester. Any question in the textbook that is significantly different from the questions in this list is beyond the scope of this course and will not be showing up on any of our quizzes or exams.

Chapter 11: 3, 6, 7, 10*, 11, 12*, 14, 15*, 17, 18*, 19, 49, 50, 51, 52, 53, 54*, 55*, 59*60, 64, 65*, 66, 67, 72, 73, 75, 76*, 77, 78, 79, 82, 87, 89*, 91*, 92, 108

Chapter 12: 1, 6, 7, 10, 13, 17*, 18*, 22*, 23, 24*, 36, 41, 49*, 50, 51*, 52*, 53, 55, 56, 57*, 59*, 62, 64*, 67, 68, 69*, 70*, 71, 73*, 75, 76* Also from **Chapter 6:** 66, 69

Chapter 13: 1, 7, 8, 12, 13, 15*, 16, 21, 22, 25*, 26*, 31, 37, 48, 51, 53, 54, 55*, 59, 65, 78, 80, 89, 92*, 94*, 96*, 110, 116*, 117*

Chapter 14: 5, 6, 7, 8, 9, 13*, 14*, 15, 16*, 19*, 20*, 23*, 24*, 26*, 29, 32, 34, 39*, 41*, 43*, 45*, 53, 55, 56, 57*, 58*, 59, 60

Chapter 15: 1, 2, 3*, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 25*, 26*, 27, 31, 33, 39, 42*, 43*, 45*, 52, 54, 55*, 56*, 60, 61, 62, 71, 77*, 78, 80*, 81*, 82*, 91, 94, 95, 96

Chapter 16: 4, 7, 9, 11*, 12, 14*, 15, 17*, 18, 19, 23*, 24*, 26, 31, 33*, 34*, 47, 49, 51, 58*, 61, 104

Chapter 17: 5, 11*, 12, 13*, 14, 17, 19*, 21, 23, 24, 27*, 28, 32, 44, 64

Chapter 18: 5, 10, 11*, 12, 13, 15*, 16, 21, 23, 25*, 26, 45, 48*, 53, 55

Grade: Your grade in the course is based solely on your demonstrated mastery of the material of Che 1144 assessed using the following instruments:

Hour Exams (3) = 40%; Recitation = 20%; Aleks = 15%; Final Exam = 25%

W and WU Grade policy – THE DROP DEADLINE (W OR CHANGE TO P/NC) HAS BEEN CHANGED FROM THE COVID-ERA LAST DAY OF CLASS TO AUGUST 4, 2025. Students who do not officially withdraw by August 4 (and receive a W grade) but stop attending classes and do not participate in any way after the withdrawal date will be given a WU grade. Any participation in class (i.e., homework, taking quizzes and exams) after the withdrawal date will disqualify you from receiving the WU grade, and you will be given the appropriate letter grade you earned.

Restrictions on Sharing of Posted Lecture Materials: Lecture materials that are posted (such as presentations, lectures, welcome video clips etc.) are shared with the class for the purpose of facilitating the learning experience and are not to be copied, downloaded or shared with anyone outside of the class.

Queens College Classroom Recording Policy: Audio or video recordings of all or parts of classes at Queens College may not be made without permission from the course instructor(s). The Office of Student Affairs and the Office of Special Services may provide for the recording of classes on behalf of a student receiving disability accommodations, missing class due to religious beliefs, or experiencing extended absence due to medical or other exigent circumstances. The Queens College Classroom Recording Policy applies to both students and visitors. Students and visitors are not authorized to copy, download, or disseminate authorized recordings to others. Students in violation of this policy are subject to disciplinary action, and visitors in violation of this policy are subject to removal from the classroom and/or campus.

REASONABLE ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES
The Office of Special Services (SPSV) is committed to supporting students with qualifying disabilities under the Americans with Disabilities Act (ADA) by providing reasonable accommodations to ensure equal access. If you have previously received accommodations due to a disability, believe you may have a disability, or have a temporary disability, please visit the office's website (https://www.qc.cuny.edu/sp/) for further information on the assistance they can offer you. Accommodations are not retroactive, so you are encouraged to get registered sooner rather than later. You may also contact their office at qc.spsv@qc.cuny.edu or call 718-997-5870 during office hours for assistance as well.

CUNY Policy on Academic Integrity: Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion as provided at: **https://www.cuny.edu/about/administration/offices/legal-affairs/policies-procedures/academic-integrity-policy/.** Please read this document, paying careful attention to the sections on plagiarism and Internet plagiarism. If you are not sure how to cite work you have found on the internet, please review the APA Guidelines provided by the Purdue OWL **(https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/re ference_list_electronic_sources.html).**

Chemistry and Biochemistry Department, Queens College - CUNY

CHEM 1141- General Chemistry II Laboratory (SUMMER 2025)

Section Number: 01

Instructor: Dr. Alexander Altman

Instructor's Email: alexander.altman@qc.cuny.edu

I**nstructor's Office Hour:** 12:00 – 12:45 in Remsen 206

Textbook for the course: Is posted on the course Brightspace.

Other required items: A bound lab notebook is required for collecting your experimental data. In addition, a scientific or graphing calculator is required and can be purchased anywhere. Note that lab coat, safety goggles, lock and required glassware are provided upon check-in.

Pre-Requisite/Co-Requisite: CHEM 1144

Coordinator: Prof. Jianbo Liu (Jianbo.Liu@qc.cuny.edu)

[Note: Students should contact their lab instructor for all lab-related questions.]

Syllabus

A. ALL lab sessions will be held on Queens College campus in Remsen 153 at your scheduled time and day.

B. This is a laboratory class with a limited capacity in the classroom. As a result, there are NO make-up options (Excused or Unexcused) for any missed lab. YOU ARE EXPECTED TO ATTEND ALL LAB SESSIONS. If you miss a lab class due to a QC approved religious reason OR due to an emergency, inform your instructor and make sure it is excused. A valid documentation for the excused absence will be required. If a doctor's note, it must be on the doctor's letterhead and signed by a physician with a different last name from the student, and a statement that the physician is not a relative of the student.

Unexcused absences are given a zero and included in the calculation of final lab score.

In case of absence(s), the following policy will be adopted:
1st Excused Absence: The missed lab will be excluded from calculating your overall lab score.
2nd Excused Absence: A quiz will be given for the missed lab OR the final lab exam score will be used to replace the missed lab score.

Any further absences will result in a zero grade for the lab irrespective of the reasons. If you are absent for 4 or more lab periods, you will NOT be allowed to take the lab final and are expected to withdraw from the course. If you are not withdrawn by the deadline, and have not participated in the course after 8/4, you will be issued a WU grade.

INC grade: There is no INC grade for this course. If you are not able to complete the course material on time, you should withdraw on time (before 8/4/25).

II. General Laboratory Rules

A. Always wear safety goggles.

B. NO short pants, skirts, open-toed shoes are allowed. Tie back long hair.

C. NO food, beverages, gum, horseplay, or unauthorized experiments allowed.

D. NO electronic devices in the laboratory except for lab related activities.

III. Laboratory Manual

A custom laboratory manual is used and is available free of charge. The lab handout for each experiment is posted on Brightspace in the module for that experiment.

IV. Prelab Preparation AND Lab Reports

A. A Prelab preparation is required for each experiment BEFORE you come to the lab. This includes reading the full experiment from start to finish in the lab manual and watching posted videos (if posted) on Brightspace. **The Prelab write-up should include section IV C (1-4), listed below. This will be initialed and graded by the instructor.** You should review the safety protocols for each experiment. There will be a pre-lab quiz on Brightspace that you need to complete before coming to lab. The quiz will not be available after the lab begins.

B. A completed LAB REPORT as per specified format is ALSO required for EACH experiment. **Lab reports are completed after the experiment is done. You should submit the lab report to Brightspace before the date of the subsequent lab session**. Late lab reports are strongly discouraged. They will receive a severe reduction in points (see section V(B)).

C. **Format of Lab Report (*Indicates Items that Need to Be Completed before coming to lab)**

*1. **Title:** Include your name, section number, experiment title, AND date of the experiment. The experiment title can be copied from the syllabus or lab book.

*2. **Objective:** It should clearly specify the aim for that day's experiment. It most often starts with "To find", "To measure", etc. Example: "To determine the heat energy released by the neutralization reaction of hydrochloric acid and sodium hydroxide."

*3. **Introduction**: Explain concisely the chemistry of the experiment in your own words. Include any equations and other scientific and mathematical explanations, i.e., the theory. Show how Chemistry is being used to accomplish the objective of the experiment. Do not copy or paraphrase from the lab handout.

*4. **Experimental Procedure:** A concise but complete summary of the steps, materials, and apparatus of the experiment. This should be a "game plan" for you to use to complete the experiment. (In your lab report, this should be written as a report of what was actually done in the lab and NOT as a list of directions.)

5. **Data:** Construct tables showing the data you gathered during the experiment. Include a picture of your original data, signed by your instructor, of measurements or observations you directly recorded during the experiment.

6. **Calculations and Results:** Show all work. If there is a repetitive calculation, you need to show the equation and its use only once; Include any tables, graphs or diagrams that may be required. Use the Insert>Equation option to add equations to your Word or Doc document.

7. **Conclusions:** Summarize your final conclusions in this section

8. **Discussion:** Give the final results you obtained . State whether results were good or bad, and reasons why, what may have affected them, and any potential problems with the experiment. Be brief but complete. There may be questions you must answer, based on the lab manual. Work them into your discussion. If you know your expected value from instructor or from reference sources, be sure to list the percent error and discuss experimental errors that can account for it.

9. **References:** Include the lab experiment write-up and other references, including those from the internet.

Finally, Lab Reports do not have to be excessively long, but they do have to cover all the important ideas of the experiment.

Submitting Lab Reports: Ideally, submit your report as a single .pdf document. Upload your report through the submission link in Brightspace. You may make multiple submissions before the report is graded. Only the last submission will be graded. No resubmissions are permitted after your report has been graded.

V. Grading: (Part A) Each lab is graded for 100 points distributed as follows - 20% Prelab Questions; 60% Lab Report; 20% Performance in the Laboratory. Part A will be weighted 85% of your lab grade.

(Part B) A written lab final will be administered on the last day of lab class. This part will be weighted 15% of final lab grade. Lab final will cover lab safety, and the contents that were covered during the entire semester.

*** Week 1 grading will be different that the rest. There will be Math quiz (20%), Safety Quiz (20%), Lab report for Exploring Boiling points (60%).

Further,

A. The Prelab quiz is not accessible after the lab begins. If material for completing the prelab questions has not been covered in the lecture, utilize the office hours of the lab instructor to get help with prelab activity.

B. ALL lab reports are due by the subsequent lab session. LATE reports are strongly discouraged, and they will receive a penalty as follows - 10% reduction with each delayed lab meeting; Lab reports will NOT be accepted after Check Out Day.

C. Reports will be graded for conformance to the above-described format and checked for plagiarism. Introduction, discussion, and conclusions are expected to be your original sentences.

D. If you have attended all the labs without any excused absences, your instructor will drop one of the lowest grades when calculating the lab average.

The criteria for Performance in The Laboratory Experiments are as follows:

1. **Safety:** If you do not work safely, your instructor will deduct points at their discretion. **Eye protection and lab coat must be worn at all times in the lab**; penalty for failure to do so is a 0 (zero) for the day and/or dismissal from that day's lab with no possibility of make-up [Points will be deducted from your final grade for safety offenses at instructor's discretion]. Safety shower, eyewash, and fire extinguisher locations must be noted. Chemical waste handling protocols must be observed; if in doubt, ask! Points will be deducted for unsafe practices or violations of waste protocols; You may be ejected from lab and receive a zero (0) for that day's work.

2. **Independence**: Your ability to work and think independently, as determined by your instructor.

3. **Efficiency and Effectiveness**: Your ability to efficiently accomplish the goals of the experiment within the lab time frame. This also includes the quality of your results.

VI. Other Important Information

(i) If you drop the course, you must check-out ASAP! Otherwise, you do so at the normal time on the final check-out day. If you do not check-out, you will be charged a fine as listed in the stockroom.

(ii) On the check-in day, a combination lock will be issued to you.

(iii) You must have a bound notebook for lab. Do NOT take any notes on scrap paper.

(iv) **Code of Conduct**

A. Plagiarism- Plagiarism or any other forms of cheating is NOT tolerated and will be severely punished by point, other penalties, and/or referral to the Chairman and the Dean; Any assignment involved will receive a grade of zero. Failure to appropriately cite a source of information may also be considered plagiarism. Using a report written by any form of AI is also considered plagiarism.

B. Everyone is expected to contribute to a positive learning environment in the lab. Inappropriate Behavior, e.g., horseplay or off-color language, oral or written, will NOT be tolerated and may lead to expulsion from class and a grade of zero.

(v) Available accommodation for students with learning disabilities: Students with disabilities needing academic accommodation should register with the Special Services Office by emailing QC.SPSV@qc.cuny.edu. For more information about services available to Queens College students, visit the Office of Special Services website: https://www.qc.cuny.edu/studentlife/services/specialserv/Pages/default.aspx

(vi) Counseling Services are also available to any Queens College student. This office assists students with personal concerns that can affect their enjoyment of and success in college. Services are free and confidential. All sessions take place on Zoom or by Telephone, depending on student preference. To make an appointment, students should call 718-997-5420 and leave a message with their phone number and CUNY ID. They may also e-mail counselingservices@qc.cuny.edu

(vii) CUNY Policy on Academic Integrity: Academic dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion as provided at https://www.cuny.edu/about/administration/offices/legalaffairs/policies-procedures/academic-integrity-policy/

Schedule of Experiments

6/30 Check In, Safety Review, Discuss Syllabus, and Refresh Basic Math (e.g., common log, natural log, quadratic equation etc). [Homework: Exploring Boiling Points (Online/Asynchronous); Prepare and Take Safety and Basic Math Quiz (Online/Asynchronous)]

7/2 Iron Content of a Tablet by Redox Titration; (Homework: Online Safety Quiz AND Basic Math Quiz Due Today)

7/7 Beer's Law

7/9* Analyzing a Complex Mixture with Paper Chromatography and Visible Light Spectroscopy

7/14 The van't Hoff i Factor and Osmosis

7/16* Kinetics

7/21 Equilibrium - Part I: Le Châtelier's Principle

7/23 Equilibrium - Part II: Measuring an Equilibrium Constant and

Preparation and Analysis of a Complex Ion Compound – Part I

7/28 Preparation and Analysis of a Complex Ion Compound – Finish

7/30 Acids, Bases, Buffers and Salts

8/4 Identifying an Acidic Salt by Titration

8/6 Qualitative Analysis of Cations: Do It Yourself

8/11 Electrochemistry

8/13 Check Out – No Work May be Done.

8/18 FINAL LAB QUIZ

*Bring a USB drive to lab on these dates

Queens College of the City University of New York
Department of Chemistry and Biochemistry
Organic Chemistry I

Chem 251.1/2 **Lab Schedule, Remsen 351** **Summer 2025**

Course Requirements:
Prerequisites for Chem 251.1: C or better in Chem 114.4 and 114.1
Pre or corequisite: Chem 251.4 (C or better if prerequisite)

LAB TEXT: *Macroscale and Microscale Organic Experiments*, Williamson and Masters, 7th ed.
Cengage Learning, 2017, ISBN: 978-1-305-57719-0 ***(NOT** the newer 8th edition).*

Lab Instructor: Joshua Mukhlall, PhD.
Instructor's Email: joshua.mukhlall@qc.cuny.edu
Lab Instructor's Office Hour: Tues. and Thurs. 2:45 – 3:15 pm
A Lab coat, safety goggles, a lock, and required glassware are provided upon check-in.
Coordinator: Professor Jianbo Liu (jianbo.liu@qc.cuny.edu)

All experiments to be done are the Macroscale version.

Date	Experiment	Williamson & Masters Chap (Page)
07/01	Check-in. No laboratory work can be done. Review of safety in the Organic Chemistry Lab., Instructions on disposal of chemical waste, Lab. protocols, Maintenance of a laboratory note-book	Chap 1-2
07/03 and 07/08	I. Melting Point Determination Determination of Boiling Point via Distillation and via Micro Boiling Point Method	Chap 3 (48-55) Chap 5 (87) Chap 3 (55-60)
07/10	II. Isolation of Clove Oil from Cloves	Chap 6 (103), Exp 5
07/15	II (continued). Extraction: Isolation of Eugenol from Clove Oil. Thin Layer Chromatography of Clove Oil and of Eugenol (Instructor will cut TLC strips and provide instructions)	Continues p112-114
07/17	III. Crystallization i. Isolation of Crystalline Acetylsalicylic Acid from Aspirin tablets (Lab Notes) ii. Recrystallization of Benzil (Lab Notes)	 Lab Notes Chap 4 (82-3)
07/22	IV. Preparation of Cyclohexene	Chap 19 (336)
07/24	V. Preparation of 1-Bromobutane	Chap 16 (313)
07/29	VI. Nucleophilic Substitution Reactions of Alkyl Halides	Chap 17 (320)
07/31	VII. Oxidation of Cyclohexanol	Chap 22 (358), Exp 4
08/05	VIII. Grignard Reaction: Preparation of Triphenylmethanol	Chap 38 (493), Exp 4-7
08/07	Complete VIII. IX. Reactions of Triphenylmethanol – Parts 1, 2, and 3	Chap 33 (447) Exp 1-3
08/12	Finish IX and any other unfinished experiments	
08/14	Check out and Lab Final Exam. No laboratory work can be done.	

It is important that you check the Chemistry 251 "Lab Notes" document for details of all experiments, because there are sometimes significant changes from the procedures described in the laboratory manual.

Attendance is required. There is NO make-up for any missed laboratory experiment. A missed lab will receive no credit and will be dropped from your final average calculation ONLY if your absence is excused by your lab instructor. A second missed lab, if excused by your instructor, will require completion of an alternate assignment given by your instructor in lieu of the lab experiment. Further absences are NOT excusable.

Safety glasses and lab coats are required in the laboratory at all times – even if you already wear glasses.
NO short pants, skirts, or open toe shoes are allowed; tie back long hair.
NO computer, tablet or cell phone use in the laboratory during class activities other than a digital lab textbook.
Do not bring food, drink/water, chewing gum, coats or backpacks into the lab – use the hall lockers.
All experiments are to be done individually – no team experiments.

Course Objectives: Students will learn basic organic lab safety, waste disposal, and techniques, and will learn how to keep an organic laboratory notebook. At the conclusion of this semester students will be prepared to do organic research if they so choose.

Assessment: You will need to keep a neat, legible laboratory notebook; a lined 100 page, 9 ¾ x 7 ½ inch composition book is best. Your lab instructor will periodically check your notebook, so it must be up-to-date, and will announce when it will be collected for grading. Lab books will not be accepted after the last day of lab class (i.e. Check Out day).
70% - Lab Notebook (Report: 35%, Results, 35%).
15% - Performance in the Laboratory (see below).
15% - A written 1 hour lab final exam given on the last day of lab class (Check Out). The lab final exam will cover lab safety, and the contents that were covered during the entire semester. It will not cover lecture material. You will need a calculator (no cell phones allowed).

The criteria for **Performance in the Laboratory**:
1. **Safety (5%):** If you do not work safely, your instructor will deduct points at their discretion. **Eye protection and lab coat must be worn at all times in the lab**; penalty for failure to do so is a 0 (zero) for the day and/or dismissal from that day's lab with no possibility of make-up. Safety shower, eyewash, and fire extinguisher locations must be noted. Chemical waste handling protocols must be observed; if in doubt, ask! Points will be deducted for unsafe practices or violations of waste protocols; You may be required to leave the lab, and you will receive a zero (0) for that day's work.
2. **Independence (5%)**: Your ability to work and think independently, as determined by your instructor.
3. **Efficiency and Effectiveness (5%)**: Your ability to efficiently accomplish the goals of the experiment within the lab time frame. This also includes the quality of your results.

Grade Key:

≥97	A+
93-96	A
90-92	A-
85-89	B+
80-84	B
75-79	B-
70-74	C+
60-69	C
55-59	C-
50-54	D+
45-49	D
<45	F

Queens College of the City University of New York
Department of Chemistry and Biochemistry
Organic Chemistry I

Chem 251.4 **Lecture Schedule** **Summer 2025**

Course Requirements:
Prerequisites for Chem 251.4: C or better in Chem 114.4 and 114.1
Pre or corequisite: Chem 251.1 (C or better if prerequisite)

Note: a C- in any pre or corequisite will not permit you to take 251.4/251.1!
You must earn a C or better in Chem 251.4 and 251.1 to go on to Chem 252.

You will need access to Brightspace for handouts, including this syllabus. Be sure to provide a valid e-mail address that you monitor. Announcements will be made via Brightspace and e-mail.

Lecture: Mon, Tue, Wed, and Thurs 9:00 - 10:40 AM, Remsen 017.

Instructor: Joshua Mukhlall, PhD.
Office Hour: Mon and Tue 10:45 AM - 11:15 AM in Remsen 017 and by appointment.
e-mail: joshua.mukhlall@qc.cuny.edu

LECTURE TEXT and on-line Achieve Homework (Required): *Organic Chemistry*, 7th Ed., Loudon and Parise (2021).
The Achieve Link is: https://achieve.macmillanlearning.com/start

The Achieve Course ID is: o2f39d

There are many options, but you must purchase Achieve alone or as a package (see below); Achieve includes the text book in electronic form (E-book).

Your choices:
(1) Many purchase options and packages are available from the Macmillan website ***BUT THIS FIRST OPTION IS STRONGLY RECOMMENDED AND CANNOT BE FOUND ON THE MACMILLAN SITE EXCEPT BY USING THIS LINK OR DOING A SEARCH WITH THE ISBN:***
https://store.macmillanlearning.com/us/product/Organic-Chemistry/p/9781319481353
for the 2-term Achieve+E-book AND paperback Study Guide and Solutions Manual, $149.99
(STRONGLY RECOMMENDED)
OR
https://store.macmillanlearning.com/us/product/Organic-Chemistry/p/9781319481339
for the 1-term Achieve+E-book AND paperback Study Guide and Solutions Manual, $136.99

Other options on the Macmillan site can be found at:
https://store.macmillanlearning.com/us/product/Organic-Chemistry/p/1319188427

(2) QC bookstore, one or two term Achieve (includes E-book) with or without the Study Guide/Solutions Manual.

The textbook contains many problems – you should do those that appear in the body of the text and at the end of each chapter (recommended problems are listed below in the Lecture Schedule). These problems will not be graded. ***They should be done together with the required on-line problems; the on-line problems are not enough by themselves to prepare you to do well in this course.***

REQUIRED ON-LINE PROBLEMS: You are required to purchase access to the Achieve on-line problem web site for this course. The cost includes the textbook as explained above.

EACH CHAPTER'S ADAPTIVE QUIZ MUST BE COMPLETED BY THE DEADLINE POSTED, including Chapter 1 for the first class. Most of the time the deadline will be before we start that chapter in class. You must *"achieve"* the target score to get credit. It is 100% or 0%, all or nothing. THE PURPOSE IS TO FORCE YOU TO READ EACH CHAPTER BEFORE IT IS DISCUSSED IN CLASS. There will be no exemptions. As you do the quiz, you have the options to read (or re-read) the relevant part of the text, or for a point penalty, ask for a hint. If you get problems correct, you will move along to the target faster (hence the adaptive part).

After each chapter is done in lecture, you will have an additional homework assignment in Achieve; due dates will mostly be 2-4 days after the chapter is finished in lecture. There are training modules (with extra credit) that you can complete before you start on the chapter problems.

If you need help, contact Macmillan tech support by clicking on the blue **?** at the bottom of the Achieve left-hand panel, and select the first option.
MACMILLAN TECH SUPPORT: Students can contact tech support online at https://mhe.my.site.com/macmillanlearning/s/ (this is not an email but probably the same site as the blue **?** noted above) or by phone at (800) 936-6899.

While studying organic with other students is recommended, you will get the maximum benefit from these problems by doing them on your own, and ***not*** doing them at the last minute.

Recommended: Molecular model kit (available on-line, about $20-60; the ~$20-30 kits on Amazon look good)

Assessment:

Chapter Exams*	**56%**
On-line Achieve Adaptive pre-class Quizzes	**7%**
On-line Achieve after-lecture homework	**8%**
Final Exam	**29%**
Total	**100%**

*The best two of three Chapter Exams will be counted toward final grade. Each 1-hour Chapter Exam will be given at the beginning of the class, followed by a 5 minute break and an approximate 30 minute lecture (approximately). The final exam will be 1 hour and 40 minutes.

Bring photo ID to exams

You ***will*** be permitted to use molecular models during exams. You will ***not*** be permitted to use books, notes, computers, or calculators during exams. Cell phones are strictly prohibited during exams. If you have any questions concerning the grading, contact me within 10 days following the exam.

There are absolutely no regrades for exams taken in pencil. If you want to have the possibility of a regrade, you must take the exam in pen, and submit the exam for regrade within 10 days.

All re-grade requests must be made in writing and attached to the exam - simply explain what error you think was made in grading; do not *under any circumstances* write anything on the exam itself. **Exams are scanned prior to being returned.**

If you miss one of the first three exams, written verification of your reason for missing the exam is required. There are no make-up exams; your average grade of the "chapter-exams" will be the average of the exams you took.

Cheating of any kind will not be tolerated. Your entire exam grade will be zero, and you will be brought up on charges of academic dishonesty to the College.

Approximate Lecture and Examination Schedule

Date	Chap.	Topic	Suggested Chapter-End Problems
June 30	1	Chemical Bonding and Chemical Structure	43-46,48-50, 52-58, 63-65
↓	2	Alkanes and Organic Nomenclature	25, 28-36, 44-49a,b,c, 50, 54-55
July 10	3	The Curved-Arrow Notation, Resonance, Acids and Bases, and Chem. Equilibrium	40-48, 56a, 57, 59-62, 64, 66, 68a
July 15		**Exam 1 (1 hr) Chapters 1-3**	
July 14	4	Intro. to Alkenes and Alkynes:	
↓		Structure and Reactivity	43-51, 53-62a, 63-64, 67, 72-77, 79-84
↓	5	Addition Reactions of Alkenes and	
↓		Alkynes	21-33, 35, 36, 39, 40-43
July 24	6	Principles of Stereochemistry	28-37, 39, 41-43, 45
July 29		**Exam 2 (1 hr) Chapters 4 – 6**	
↓	7	Cyclic Compounds and	
↓		Reaction Stereochemistry	32-40, 42-44a, 46, 50, 52-55, 60, 67-70, 76-78, 83
↓	8	Nomenclature and Noncovalent	
↓		Intermolecular Interactions	31, 32, 36, 39-41, 44, 45, 48, 50, 52, 55, 56, 58
Aug. 7	9	Alkyl Halides, Substitution and Elimination	35-3739-54, 57, 60-65, 70, 71, 77
Aug. 12		**Exam 3 (1 hr.) Chapters 7 – 9**	
↓	10	Free Radicals, Organometallics, Carbenes	35, 36, 39, 41, 42, 44, 47-50, 60, 68
Aug. 14	11	Alcohols and Thiols	41, 43-52, 57-66, 68-70, 73-76, 80
Aug. 18		**Final Exam: Chapters 1 – 11.**	

Course Preparation and Advice: Understanding the basic concepts from General Chemistry is critical to understanding reactions and mechanisms in organic chemistry. While these concepts are reviewed in Organic Chemistry, it will be assumed that this is the second time you are seeing this and that you understand the concepts. A brief list from the most recent Queens College textbooks for Chem 113 and 114 is given below; if you are transferring in, try to match the topics with those in your textbook. Once you start Chem 251, read the textbook before the lecture; take seriously the fact that you really do need to know and understand every reaction we cover in class (no exceptions). Understanding mechanisms will help you remember the reactions.

Review Chapters from Zumdahl & Zumdahl *Chemistry*:
Chem 113
Chapter 4: Types of Chemical Reactions and Solution Stoichiometry
Chapter 8: Bonding: General Concepts
Chapter 9: Covalent Bonding: Orbitals
Chem 114
Chapter 10: Liquids and Solids (Liquids only)
Chapter 14: Acids and Bases
Chapter 17: Spontaneity, Entropy, and Free Energy

or Silberberg *Chemistry*:
Chem 113
Chapter 3: Stoichiometry
Chapter 4: Major Classes of Chemical Reactions
Chapter 6: Thermochemistry
Chapter 9: Models of Chemical Bonding
Chapter 10: Shapes of Molecules
Chapter 11: Theories of Covalent Bonding
Chem 114
Chapter 12: Liquids and Solids (Liquids only)
Chapter 18: Acid – Base Equilibria
Chapter 20: Thermodynamics: Entropy and Free Energy

Course Objectives: Students will learn structural organic chemistry, including bonding, functional groups, stereochemistry, and conformational analysis, as well as the nomenclature for labeling these compounds and structures. In the first semester of organic chemistry a limited number of functional groups, including alkanes, alkenes, alkyl halides, and alcohols, will be introduced along with their reactions. The mechanisms of those reactions and their common mechanistic features will be stressed. Understanding these mechanisms, rather than their rote memorization, is a principal objective, as only understanding of mechanisms will allow new reactions to be understood. Applications of reactions to multistep synthesis will be introduced. At the conclusion of this semester students will almost be prepared to start doing organic research if they so choose, but will need Chapter 14 on NMR (covered in the first month of Chem 252).

Assessment: Problem-solving ability will be tested using exams and on-line graded problems; while memorization of naming and drawing conventions as well as reactions will be required, the emphasis will be on understanding structures of organic compounds and their mechanisms of reaction. While the on-line homework problems will be graded, the intent is to help student learning, rather than provide significant assessment. These and additional sample problems and answers both in the book and on the course web site will be representative of the material that will be found on exams.

Grade Key:

≥97	A+
93-96	A
90-92	A-
85-89	B+
80-84	B
75-79	B-
70-74	C+
55-69	C
50-54	C-
45-49	D+
40-44	D
<40	F