



Additional course information can be found in OneNote.

### Prerequisites

A grade of C or better in CHEM 113.4 and MATH 122 (or equivalent). A grade of C or better CHEM 113.1. *Students who have not completed CHEM 113.1 must be enrolled in CHEM 113.1 and will not be permitted to drop CHEM 113.1 while remaining in CHEM 114.4.*

### Instructor

#### Dr. Cherice M. Evans

Associate Professor, Physical Chemist  
Office: Remsen 211B (ESA dogs in office)

Office Hours: Through Booking Calendar in Teams  
Contact: Through Chat feature in Teams

### Book/Online Resources

E-book and homework should be purchased through QC Bookstore, as a special price was negotiated with publisher.

Book: Overby/Chang – Chemistry, 14<sup>th</sup> edition  
(McGraw-Hill, New York)

Homework/E-book: [www.aleks.com](http://www.aleks.com)

Aleks course code: CH4AA-GWMWH

### Material to be Covered

Chapters 11 – 19 with some special topics pulled from Chapters 20 – 24 (time permitting).

### Final Exam (Max score: 200/200)

The final examination is a department final with the date and time to be announced. Absence from this final – if you can pass the course – will require that you complete a make-up examination that will be scheduled the week before Spring 2024 classes begin.

### Grade Scale

|                |              |
|----------------|--------------|
| 96 – 100% = A+ | 88 – 95% = A |
| 84 – 87% = B+  | 76 – 83% = B |
| 72 – 75% = C+  | 64 – 71% = C |

60 – 63% = C–

*Students earning above a 64% on departmental final with this grade in the course will receive a C in the course.*

|              |             |
|--------------|-------------|
| 50 – 59% = D | 0 – 50% = F |
|--------------|-------------|

### Grade Details

|                   |                  |
|-------------------|------------------|
| Homework          | 450 points (45%) |
| In-class Quizzes  | 110 points (11%) |
| Modular Exams     | 240 points (24%) |
| Final Exam        | 200 points (20%) |
| Bonus Assignments | 100 points (10%) |

### Assignment Notes

#### Homework (Max score: 500/450)

There are 15 homework assignments worth 30 points each. Additional bonus assignments also are available. Due dates and assignment details are provided on a document in OneNote and can be found in Aleks.

#### In-class Quizzes (Max score: 120/110)

In class quizzes are multiple choice quizzes given at the beginning of every lecture (except the first day of class and on days when modular exams are scheduled). Topics of quizzes will always be the material covered in the previous lecture. Each quiz is worth 6 points. No additional time will be given if you are late to class and no make-up quizzes will be given. Quizzes are grade with 50% of grade receive for completing quiz and 50% of grade weighted based on quiz performance.

#### Module Exams (Max score: 280/240)

Module exams will be two to four page exams (two sheets of paper maximum) that will be short answer questions covering the material from all homework due before the scheduled exam. Module exam dates are Sept 13, Sept 27, Oct 11, Oct 25, Nov 8, Nov 29 and Dec 11. You will have 60 minutes to complete the quiz, and each quiz is worth 40 points. No make-up quizzes will be given, since one quiz counts as bonus points in the course.

*Note: This is a 4 credit hour course and by New York State Law should require a minimum of 8 hours per week of external assignments. If you cannot devote 8 hours per week to this course outside of lecture, then you will need to reconsider your commitments.*

**CHEM 341.3 & 790.1 secs. 1- Instrumental Methods & Basic Techniques for Research in Analytical and Physical Chemistry Laboratory**

Tuesdays, Thursdays, 9:30-10:45 AM; room 105 RE

**SYLLABUS**

**I. Required Text:** D. A. Skoog, F. J. Holler, and S. R. Crouch, *Principles of Instrumental Analysis*, 7<sup>th</sup> ed. Cengage Boston **2018** ISBN: 9781305577213

**II. Suggested References:** Garland, Nibler, Shoemaker *Experiments in Physical Chemistry*, seventh ed. (or any) McGraw-Hill New York 2003 **(On reserve in Rosenthal Library)**  
Atkins, de Paula *Physical Chemistry*, ninth ed. (or any) W. H. Freeman and Company New York 2002 **(On reserve in Rosenthal Library)**

**III. Attendance:** Attendance is required; *do not come late*; your grade may be adversely affected.

**IV. Homework:** Problem( set)s will be randomly scheduled on BlackBoard. A penalty of a 10% credit loss per day will be imposed on late homework; submissions past 6 days late will not be accepted. You may work together on the homework but submissions must be original and not copied from another individual. If duplicate work is received, no credit will be given.

**V. Examinations:** There will be two required in-class tests and one comprehensive final examination. **Make-ups are discouraged** as rescheduling is very difficult; see me first. You may **not miss** the final exam; missing or failing the final results in **F** for the course. There may also be randomly scheduled quizzes throughout the semester; they will not be announced prior to their occurrence.

**VI. Other Required Materials:** You will need to provide your own *scientific* calculator.

**VII. Code of Conduct**

**A. Plagiarism-** Plagiarism or any other form of cheating is not tolerated. Any student perpetrating such will receive a zero (0) for the assignment in question and a warning and/or referral to the Chairman and/or the Dean, along with other possible penalties. A next offense will **include also automatic failure of the course (F)**.

**B. In-Class Conduct-** Inappropriate behavior, *e.g.*, off-color language, also will not be tolerated and will lead to expulsion from class and a zero (0) if during an examination or assignment. **Cellphone, tablet and computer usage is not permitted at any time during exams.**

**VIII. Grading:** The two in-class exams together comprise 30% of your course grade, as do any randomly scheduled quizzes and homework, and the final exam is 40%. Positive class participation may increase your final course grade.

**IX. Communication:** Contact me via our discussion group on BlackBoard; use e-mail only for messages that need to be less public. This syllabus and any ancillary materials will be posted on Blackboard.

**X. Course Schedule:** *(Topics, times subject to change; course may run ahead or behind this timetable.)*

| <u>Week</u> | <u>Dates</u> | <u>Topic</u>                                           | <u>Chapter</u> |
|-------------|--------------|--------------------------------------------------------|----------------|
| 1           | 8/29         | Introduction to Instrumental Analysis                  | 1              |
|             | 8/31         | Signals and Noise                                      | 5              |
| 2           | 9/5          | Introduction to Spectroscopy                           | 6              |
|             | 9/7          | Components of Optical Instruments                      | 7              |
| 3           | 9/12         | Molecular Spectroscopy: UV-Vis Spec'y                  | 13             |
|             | 9/14         | Molecular Spectroscopy: UV-Vis Spec'y                  | 14             |
| 4           | 9/19         | Molecular Spectroscopy: Luminescence Spec'y            | 15             |
|             | 9/21         | Molecular Spectroscopy: Luminescence Spec'y            | 15             |
| 5           | 9/26         | Molecular Spectroscopy: Infrared Spec'y                | 16             |
|             | 9/28         | Molecular Spectroscopy: Infrared Spec'y                | 17             |
| 6           | 10/3         | <b><u>EXAM 1</u></b>                                   |                |
|             | 10/5         | Molecular Spectroscopy: Raman Spec'y                   | 18             |
| 7           | 10/12        | Molecular Spectroscopy: Raman Spec'y                   | 18             |
|             | 10/17        | Introduction to Separation Science 1                   | 26             |
| 8           | 10/19        | Introduction to Separation Science 1                   | 26             |
|             | 10/24        | Gas Chromatography                                     | 27             |
| 9           | 10/26        | High Performance Liquid Chromatography                 | 28             |
|             | 10/31        | High Performance Liquid Chromatography                 | 28             |
| 10          | 11/2         | Principles of Mass Spectrometry                        | 11             |
|             | 11/7         | Design of Mass Spectrometry                            | 11             |
| 11          | 11/9         | Applications of Mass Spectrometry                      | 20             |
|             | 11/14        | Applications of Mass Spectrometry                      | 20             |
| 12          | 11/16        | <b><u>EXAM 2</u></b>                                   |                |
|             | 11/21        | Introduction to Electroanalytical Chemistry            | 22             |
| 13          | 11/28        | Potentiometry                                          | 23             |
|             | 11/30        | Potentiometry/Coulometry                               | 23/24          |
| 14          | 12/5         | Coulometry/Voltammetry                                 | 24/25          |
|             | 12/7         | Voltammetry                                            | 25             |
| 15          | 12/14        | <b><u>FINAL EXAMINATION 8:30 – 10:30 AM RE 105</u></b> | <b>all</b>     |

**Who should take this course?**

*Chemistry In Modern Society* (Chem 163) is a 3 credit course intended for *non-science majors* and it counts towards general science requirements. *This course satisfies the Scientific World (SW) requirement of the Pathways General Education Flexible Core.*

**Learning Outcomes:**

1. Obtain a general knowledge of history of the field of chemistry and its relation to life sciences and scientifically inclined to gather, interpret, and assess information from print, audio, video, and internet.
2. Obtain a general knowledge of how scientific theories are formulated and tested by experimentation. Analytically evaluate evidence and arguments and critically evaluate for misconception or misrepresentation in current events.
3. Distinguish conclusions based on factual evidence to inconclusive models that support some or part of the evidence.
4. Understand the fundamental chemistry principles of everyday household items and their safety.

**Course Content:**

This course presents the basic principles of chemistry with intellectual honesty but without focusing on theory and mathematical analysis used in courses for majors. The focus is instead on practical applications of chemistry that we see in everyday life that have significant impact, both good and bad, on human society. Wherever possible chemical demonstration are done in class to illustrate the concepts. The approach throughout is to provide a background of chemical principles and processes and relate them to their impact on human society. Problems involving environmental pollution, energy sources, nuclear chemistry, and human health are discussed. Topics are presented that introduce a new approach, Green Chemistry, to designing chemicals and chemical processes that are beneficial for human health and the environment.

**Course Objectives:**

1. Understand how observations, the formulation and testing of hypotheses and the scientific method are used to discover the principles of chemistry and prepare materials used in real world applications.
2. Understand the meaning of physical and chemical properties, measuring properties like mass, volume, density, temperature, etc. with proper units and use them to distinguish pure and impure substances, elements, compounds, and mixtures.
3. Be able to read the periodic table and associate the symbol and other numbers there with element name, subatomic particle, and mass.
4. Understand the periodicity in physical and chemical properties like thermal and electrical conductivity, specific heat capacity, atomic size, ion size, ability to lose or gain electrons, form ionic or covalent compounds, etc. and highlight how periodic table guides in making new materials with desired properties.
5. Be able to understand what chemical formulas mean, what bonds them together, visualize their overall structure and what leads to their bulk physical properties like its state of matter (solid, liquid, or gas), viscosity, vapor pressure, boiling point, melting point, etc.
6. Be able to appreciate the significance of chemistry in your daily life. Understand household chemicals and their properties like acidity and basicity. Understand the relationship between chemicals found in food, air, water, and soil.
7. Understand chemical energy involved in chemical reactions and its relation to other forms of energy like heat and electricity.

8. Be able to evaluate the formula mass and the concept of mole.
9. Understand the law of conservation of mass and the requirement to account for the number of atoms before and after a reaction.
10. Be able to evaluate the amount of materials needed and the amount of products that can be formed when a chemical reaction is carried out.
11. Be able to critically evaluate issues related to science described in communications media. Be able to assess ethical, moral, economical, health, and environmental impacts from all sources and make informed decisions as consumers and voters.

#### **Instructor Information:**

PROF. JULIE LEVENTHAL    jcolis@qc.cuny.edu  
 Office Hours:                FRI 12:55-1:55PM or by appointment

#### **Section Information:**

Class Meets every Friday 10:00AM to 12:50PM at REMSEN 017, QUEENS COLLEGE CAMPUS.

#### **Textbook:**

**21<sup>st</sup> Century Chemistry**, Kimberly Waldron, Roberts and Company Publishers, 2014. ISBN 978-1-936221-39-4. You can buy the textbook from any source. The publisher link is given here for your easy reference. Roberts and Company: <http://www.roberts-publishers.com/>

#### **CLASS & EXAM SCHEDULE:**

LECTURE Class meets every FRIDAY as per QC's Friday class schedule.  
 (Bring a CALCULATOR).

#### ***LECTURE CLASS will follow after EXAMS 1 and 2.***

Note: Examination dates are fixed-but chapter coverage may vary somewhat

08/25: Chapter 1 SCIENCE

09/01: Chapter 2 ATOMS

09/08: Chapter 3 MATTER

**09/22: EXAM 1. Regular class will follow after class exam. Chapter 4 BONDS**

09/29: Chapter 4 BONDS

10/06: Chapter 6 GASES

10/13: Chapter 6, 7

10/20: Chapter 7 CHEM RXNS

10/27: Chapter 7, 8 WATER

**11/03: EXAM 2. Regular class will follow after class exam. Chapter 9 SOLUTIONS**

11/10: Chapter 10 ACID RAIN

11/17: Chapter 12 ENERGY

12/01: Chapter 13 SUSTAINABILITY

12/08: **CATCH UP/ REVIEW**

**12/15: FINAL EXAM @ 11AM – cumulative of all chapters covered**

Students are **required** to check their QC email and the Blackboard (BB) Learning System daily. Lecture notes, homework assignments and due dates, and exam dates will be found on BB and thru QC email. **Recording lectures is strictly prohibited.**

**Class Quizzes:** You can expect quizzes during every class given once or twice during a class period. These quizzes test your understanding of what was done in class and if you are keeping up with the reading.

**Class Homework:** There will be several homework assignments throughout the semester that will be posted on BLACKBOARD in order to ensure that students are adequately preparing for class and to reinforce class learning. It is imperative that students hand these in **ON TIME** as they **will not be accepted late**. The HOMEWORK will be *unavailable* on Blackboard after the due date has passed.

**Class Exams:** All material covered up to the previous class will be included for the exam. All exams are cumulative. Cell phones are to be **turned off** (not on vibrate). Recalling old material is required for learning new material. Students are expected to take each exam; if you must miss an exam due to an actual emergency, the exam may be waived only if the professor determines such action to be warranted by the emergency and that you have behaved responsibly and have alerted the professor at the first opportunity. ***There are absolutely no makeup exams.*** Students who miss an exam will have it added to the total worth of the final exam (final exam would be worth **200pts**); **PROVIDED** that acceptable documentation of the absence is presented to the professor. Without a legitimately documented reason, a grade of **0** will be assigned. **You must take the cumulative final exam to receive a passing grade in the course.**

**How to Study for this course?** Silence your cell phones. *Keep your textbook, scientific calculator and periodic table available during class.* If you don't understand something ask me during question-answer time in class, or seek the help of free tutoring offered by the college and chemistry department. Quizzes are designed to help you understand the material. If you take all quizzes by coming to class on time and staying till the end of class, you can perform very well in the exams.

### **Course Grading:**

Two class exams and one final exam: 65%

Quizzes: 20%

Homework: 15%

To be fair to all students, absolutely no extra credit assignments will be given to improve one's grade. Letter grades follow the college guidelines.

**Do not cheat during quizzes and exams. All violations will be reported and appropriate actions as per college guidelines will be taken.**

This policy and others related to candidates' issues are available to you at:

<http://www.qc.cuny.edu/StudentLife/Documents/AcademicIntegrityPolicywithoutmemo.pdf>

The instructor will not give advice on rules, deadlines, and financial aid consequences of any letter grade. A grade of INC should not be requested by student to avoid F or WU in the transcript.

### **REASONABLE ACCOMMODATIONS FOR CANDIDATES WITH DISABILITIES**

Candidates with disabilities needing academic accommodation should: 1) register with and provide documentation to the Special Services Office, Frese Hall, Room 111; 2) bring a letter to me indicating the need for accommodation and what type. *This should be done during the first week of class.* For more information about services available to Queens College candidates, contact: Special Service Office; Frese Hall, Room 111; 718-997-5870 (Monday – Thursday 8:00 a.m. to 5:00 p.m. & Friday 8:00 a.m. to 4 p.m.).



Basic Organic Chemistry Laboratory Chem 102.1  
Chemistry & Biochemistry  
Fall 2023

**Instructor Information**

CHEM102.1 section number: 25692 (Thur 1:40PM- 4:30PM)

Lab Instructor: Karamvir Singh

Email: [Karamvir.Singh46@login.cuny.edu](mailto:Karamvir.Singh46@login.cuny.edu)

Office hour : Mondays 12:00PM in Remsen 206

Lab room: Remsen 352

Coordinator: Prof. Yu Chen ([yu.chen1@qc.cuny.edu](mailto:yu.chen1@qc.cuny.edu))

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

**Course Description**

Students will learn basic organic laboratory techniques including isolation and purification of organic compounds, and identification of organic compounds using chromatography and chemical tests; problem solving via understanding the use of the analytical tests is emphasized. Structural organic chemistry, which is a major focus of the lecture part of the course, will be covered in a molecular model session. Students will learn to carry out basic preparations of compounds and mixtures. At the conclusion, students will have a foundation that will allow them to carry out basic organic laboratory procedures, they will know how to keep an organic laboratory notebook, and they will know basic safety procedures including handling of hazardous waste.

**Course Requirements:**

PREREQ or COREQ: CHEM 1023. PRE: C or better in CHEM 1013 and 1011 (or CHEM 1134 and 1131 or CHEM 1144 and 1141

**Course Goals/Objectives**

To familiarize the learner with key reactions and lab techniques involving organic compounds, their derivatives.

Learning Objectives

**Course Learning Objectives: (Fall 2023)**

Students in Chem 102.1 lab will be able to:

1. Apply safe laboratory practices, including use of proper protective gear, proper handling of laboratory glassware, equipment, and chemical reagents
2. Identify inherent risks associated with specific reagents employed in each experiment using the MSDS Database.
3. Apply the Scientific Method to a given experimental procedure/protocol design (Appendix I: Scientific Method)
4. Write a laboratory report (Appendix II: Components of a Laboratory Report; Appendix III Assessment Rubric)
5. Calculate a limiting reagent, yield, and percent yield
6. Calculate accuracy and precision and complete an error analysis (Appendix IV: Elements of Error Analysis)

7. Identify laboratory instruments used to determine product identity, purity, and yield
8. Perform basic laboratory techniques, including recrystallization, vacuum filtration, aqueous extraction, thin layer and column chromatography.
9. Articulate classic organic chemistry mechanism(s) applied in each protocol/ procedure and identify them according to their discoverer (Appendix V: Key Mechanisms Applied in Organic Chemistry 102.1 Lab)
10. Apply learned organic chemistry mechanisms to key human physiologic/biochemical processes (Appendix VI: Key Biochemical Reactions)
11. Create connections between new information and prior knowledge\*\* (Synthesis and Application of Learning)
12. Create a data table in Excel and perform data analysis which includes statistical (mean, median, mode) analysis and error analysis given a set of data.

The first step in becoming a good scientist is ardent observation. With observation, questions may be asked. This leads to generation of hypotheses, which may then be tested. In this class, the science and art of observation will be emphasized. Learners will be assessed in a weighted fashion according to a rubric founded in the Application of the Scientific Method, with emphasis on observation.

Observations may be divided into qualitative and quantitative measures. Qualitative measures are subjective and rely on our senses, and perception of color, light, texture, smell. These observations can be relayed to another learner through use of descriptive adjectives (i.e., aqua, translucent, viscous, fragrant liquid). Learners will become familiar with commonly used adjectives in the scientific world and will be encouraged to seek additional descriptors when reporting results. Quantitative measures are based on physical dimensions such as mass, length, diameter, circumference and are objective measures. These objective measures will be calibrated to eliminate bias in measurements taken from similar instruments (i.e., two thermometers). However, each instrument has a known percent error in measurement, which is typically indicated on the given instrument. This percent error will be included in your results analysis. The value obtained will only be reported in significant figures consistent with the given instrument's accuracy. This concept will become more apparent as we begin to explore and employ the glassware and instrumentation in lab.

### **Books, materials, tools, and accounts**

Queens College Online Bookstore: <https://qc.textbookx.com/institutional/index.php>

### **Books and Materials:**

Laboratory Experiments for Introduction to General, Organic and  
Biochemistry, F. Bettelheim and J. Landesberg, 8th Edition, Brooks/Cole, 2013  
(ISBN-10: 1133106021; ISBN-13: 978-1133106029)

Carbonless Lab Notebook (Scientific Grid Format) - 8.5" x 11", 50 Sets of Pages, 100 Sheets Total -  
Duplicator [Wire-O Bound]

### **Required tools and accounts**

Blackboard



### Technical Support

If you require technical help with your Queens College email or CUNYfirst account please contact the Queens College helpdesk by emailing [support@qc.cuny.edu](mailto:support@qc.cuny.edu) or visiting their website: <https://www.qc.cuny.edu/Computing/helpdesk/Pages/Welcome.aspx>.

### **SAFETY FIRST!!!**

The following safety guidelines must be always followed:

- **No cellphone, tablet, or computer allowed at any time during the lab.** You must have a calculator for calculations. You may not use a cellphone for that purpose.
- Goggles must be always worn in the lab, even if you have completed your experiment and even if you already wear glasses.
- Having and/or consuming food or drink in the laboratory is strictly prohibited.
- Masks are recommended to be worn in the lab
- **Never** leave a flame unattended.
- Tie back long hair and secure all loose clothing before conducting any experiments.
- Feet must be completely covered during lab – **no open toed shoes** (sandals, flip-flops or the like).
- If an accident occurs, notify your lab instructor immediately.
- Do not run or throw anything in the lab.
- You **must** read the lab and procedure **prior to class**, as part of safety preparation. Failure to do so will result in an F for the particular lab you are unprepared for.
- Always listen carefully to your lab instructor for safety precautions and procedure Modifications.
- **All chemical waste must be disposed of properly.** Your instructor will provide you with specific instructions at the beginning of each lab regarding how to handle the chemical waste for that experiment.
- **Failure to adhere to any of the above safety guidelines will result in points being deducted from your lab report and may result in your removal from the lab and an automatic failure for that experiment.**

### **Chemistry 102.1 Grading Rubric**

**Lab Notebook:** You must obtain a carbonless organic chemistry notebook, as all your work will be recorded in this notebook and graded by its clarity and accuracy.

**Assessment:** Lab instructors will assess students by grading both of their online and in person assignments. In person instructors will collect lab notebooks, collecting laboratory products and assessing them for yield and purity and accuracy of reported results in the student notebook. In addition, students will be observed during lab, and assessed based on their technique and adherence to safety rules.

### Grade Breakdown

|                               |     |
|-------------------------------|-----|
| Lab reports and lab notebooks | 50% |
| 6 lab quizzes                 | 20% |
| Lab techniques                | 15% |
| Lab final                     | 15% |

Your notebook must include the following components for each experiment:

1. Experiment: title, date performed and Purpose of lab
  2. Introduction: In this section you should summarize the objective of the experiment in your own words. Include any chemical formulas, structures, equation, and reactions. Any relevant ideas regarding the experiment should also be written here.
  3. Procedure: You will not be allowed to use your lab book during class. Summarize the procedure in the notebook in your own words. It must be clear and detailed enough, so you can follow it and perform the experiment based on your write-up. This can be written as a step by step, or a “shopping list” type. As long as it is detailed enough for you to perform the whole experiment without any additional resources.
  4. Safety: Outline the chemicals used in this lab. their MSDS importance and safety precaution, as well as disposal of waste must be looked up and summarized. You can find the MSDS information by going to ChemWatch website at: <http://jr.chemwatch.net/chemwatch.web>.
    - Account: *queensmsds*
    - Username: *everyone*
    - Password: *eqkq+2SFEI4=*
  5. Datasheet: Create a clear data sheet in your notebook. This may be the same data sheet from the book but must be copied to the notebook and not paste on it. Be sure that any tables should be drawn using a ruler.
  6. Conclusion / Discussion: Summarize your data, explain whether you were successful in the experiment, and any errors that may have occurred.
- Note that 1-5 (Pre-lab and an empty data sheet ready to fill out in your notebook) should be done **before** you attend lab. The instructor will check your notebook prior to the beginning of the lab and initial it. Failure to complete the notebook will result in a zero for the lab, and you will not be allowed to perform the experiment that day.
  - Your notebook will be collected at the completion of every 2 labs. You will have to submit the completed labs to your instructor. These will be graded but will not be returned to you. You will get the grade from the instructor and may review it.
  - All laboratory experiments are to be performed **individually** (and evaluated by your instructor). There are **no** team experiments unless your instructor decided to do so. Each person registered for lab is to perform each laboratory experiment individually. You will be graded on your class performance, and it is 15 percent



of your lab grade. Class performance includes your lab techniques, efficiency of work, safety, independence, and cleaning of station as well as disposal of waste.

**The criteria for Performance in the Laboratory:**

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]. You **MUST** 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.
4. **Cleanness:** cleaning of workbench, hood, and common chemical, balance, and waste areas & disposal of waste.

- You are scheduled to take 6 quizzes and a final exam. The quizzes are not cumulative and will include questions of the previous lab and the lab to be performed on the day of the quiz.
- The final exam will include conceptual and procedural questions from the variety of experiments done in class, and different questions pertaining to labs. There is no option for a make - up final exam. You must attend the exam as scheduled on this syllabus, not as per CUNYFirst.

**Important note on missed classes, late work**

Attendance in the laboratory is mandatory.

Students must report to the lab on time.

There are no make-up labs, any missed labs (for a valid reason – illness, verified by a note from a registered physician; court appearance, verified by a note from an officer of the court; death in the family) will be excused with proper documentations. 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 with a valid reason. 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.

**Reasonable Accommodations for Students With Disabilities**

Students with disabilities needing academic accommodation should register with the Special Services Office by emailing [QC.SPSV@qc.cuny.edu](mailto: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>

### 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 ACS Guidelines provided by the [American Chemical Society](#).

### Class Schedule

This schedule is subject to change. Students will be notified in writing of such changes.

Class Schedule and lab sequence to be determined with Professor Choi and Professor [your name] and the tentative schedule appears below:

| Week | Date   | Experiment                                                                      | Page     |
|------|--------|---------------------------------------------------------------------------------|----------|
| 1    | 31-Aug | Check-in. Review of safety rules and instruction for waste disposal.            |          |
| 2    | 7-Sep  | <b>Experiment 1</b> Isolation of pure acetylsalicylic acid from aspirin tablets | Hand out |
| 3    | 14-Sep | <b>Experiment 2:</b> Molecular Models (Quiz 1)                                  | 239      |
| 4    | 21-Sep | <b>Experiment 3:</b> Identification of Hydrocarbons                             | 289      |
| 5    | 28-Sep | <b>Experiment 4:</b> Chromatography (Quiz 2)                                    | 275      |
| 6    | 5-Oct  | <b>Experiment 5:</b> Identification of Alcohols and Phenols                     | 301      |
| 7    | 12-Oct | <b>Experiment 6:</b> Identification of Aldehydes and Ketones (Quiz 3)           | 313      |
| 8    | 19-Oct | <b>Experiment 7:</b> Carboxylic Acids and Esters                                | 329      |
| 9    | 26-Oct | <b>Experiment 8:</b> Amines and Amides (Quiz 4)                                 | 341      |
| 10   | 2-Nov  | <b>Experiment 9:</b> Preparation of Aspirin                                     | 365      |
| 11   | 9-Nov  | <b>Experiment 10:</b> Isolation of Caffeine from Tea Leaves (Quiz 5)            | 377      |
| 12   | 16-Nov | <b>Experiment 11:</b> Carbohydrates                                             | 389      |
| 13   | 30-Nov | <b>Experiment 12:</b> Preparation of Hand Cream (Quiz 6)                        | 423      |
| 14   | 7-Dec  | Check-out: Final                                                                |          |



Basic Organic Chemistry Laboratory Chem 102.1  
Chemistry & Biochemistry  
Fall 2023

**Instructor Information**

CHEM102.1 section number: 25693 (Wed 9:10AM-12:00PM)

Lab Instructor: Karamvir Singh

Email: [Karamvir.Singh46@login.cuny.edu](mailto:Karamvir.Singh46@login.cuny.edu)

Office hour : Mondays 12:00PM in Remsen 206

Lab room: Remsen 351

Coordinator: Prof. Yu Chen ([yu.chen1@qc.cuny.edu](mailto:yu.chen1@qc.cuny.edu))

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

**Course Description**

Students will learn basic organic laboratory techniques including isolation and purification of organic compounds, and identification of organic compounds using chromatography and chemical tests; problem solving via understanding the use of the analytical tests is emphasized. Structural organic chemistry, which is a major focus of the lecture part of the course, will be covered in a molecular model session. Students will learn to carry out basic preparations of compounds and mixtures. At the conclusion, students will have a foundation that will allow them to carry out basic organic laboratory procedures, they will know how to keep an organic laboratory notebook, and they will know basic safety procedures including handling of hazardous waste.

**Course Requirements:**

PREREQ or COREQ: CHEM 1023. PRE: C or better in CHEM 1013 and 1011 (or CHEM 1134 and 1131 or CHEM 1144 and 1141

**Course Goals/Objectives**

To familiarize the learner with key reactions and lab techniques involving organic compounds, their derivatives.

Learning Objectives

**Course Learning Objectives: (Fall 2023)**

Students in Chem 102.1 lab will be able to:

1. Apply safe laboratory practices, including use of proper protective gear, proper handling of laboratory glassware, equipment, and chemical reagents
2. Identify inherent risks associated with specific reagents employed in each experiment using the MSDS Database.
3. Apply the Scientific Method to a given experimental procedure/protocol design (Appendix I: Scientific Method)
4. Write a laboratory report (Appendix II: Components of a Laboratory Report; Appendix III Assessment Rubric)
5. Calculate a limiting reagent, yield, and percent yield
6. Calculate accuracy and precision and complete an error analysis (Appendix IV: Elements of Error Analysis)

7. Identify laboratory instruments used to determine product identity, purity, and yield
8. Perform basic laboratory techniques, including recrystallization, vacuum filtration, aqueous extraction, thin layer and column chromatography.
9. Articulate classic organic chemistry mechanism(s) applied in each protocol/ procedure and identify them according to their discoverer (Appendix V: Key Mechanisms Applied in Organic Chemistry 102.1 Lab)
10. Apply learned organic chemistry mechanisms to key human physiologic/biochemical processes (Appendix VI: Key Biochemical Reactions)
11. Create connections between new information and prior knowledge\*\* (Synthesis and Application of Learning)
12. Create a data table in Excel and perform data analysis which includes statistical (mean, median, mode) analysis and error analysis given a set of data.

The first step in becoming a good scientist is ardent observation. With observation, questions may be asked. This leads to generation of hypotheses, which may then be tested. In this class, the science and art of observation will be emphasized. Learners will be assessed in a weighted fashion according to a rubric founded in the Application of the Scientific Method, with emphasis on observation.

Observations may be divided into qualitative and quantitative measures. Qualitative measures are subjective and rely on our senses, and perception of color, light, texture, smell. These observations can be relayed to another learner through use of descriptive adjectives (i.e., aqua, translucent, viscous, fragrant liquid). Learners will become familiar with commonly used adjectives in the scientific world and will be encouraged to seek additional descriptors when reporting results. Quantitative measures are based on physical dimensions such as mass, length, diameter, circumference and are objective measures. These objective measures will be calibrated to eliminate bias in measurements taken from similar instruments (i.e., two thermometers). However, each instrument has a known percent error in measurement, which is typically indicated on the given instrument. This percent error will be included in your results analysis. The value obtained will only be reported in significant figures consistent with the given instrument's accuracy. This concept will become more apparent as we begin to explore and employ the glassware and instrumentation in lab.

### **Books, materials, tools, and accounts**

Queens College Online Bookstore: <https://qc.textbookx.com/institutional/index.php>

### **Books and Materials:**

Laboratory Experiments for Introduction to General, Organic and  
Biochemistry, F. Bettelheim and J. Landesberg, 8th Edition, Brooks/Cole, 2013  
(ISBN-10: 1133106021; ISBN-13: 978-1133106029)

Carbonless Lab Notebook (Scientific Grid Format) - 8.5" x 11", 50 Sets of Pages, 100 Sheets Total -  
Duplicator [Wire-O Bound]

### **Required tools and accounts**

Blackboard



### Technical Support

If you require technical help with your Queens College email or CUNYfirst account please contact the Queens College helpdesk by emailing [support@qc.cuny.edu](mailto:support@qc.cuny.edu) or visiting their website: <https://www.qc.cuny.edu/Computing/helpdesk/Pages/Welcome.aspx>.

### **SAFETY FIRST!!!**

The following safety guidelines must be always followed:

- **No cellphone, tablet, or computer allowed at any time during the lab.** You must have a calculator for calculations. You may not use a cellphone for that purpose.
- Goggles must be always worn in the lab, even if you have completed your experiment and even if you already wear glasses.
- Having and/or consuming food or drink in the laboratory is strictly prohibited.
- Masks are recommended to be worn in the lab
- **Never** leave a flame unattended.
- Tie back long hair and secure all loose clothing before conducting any experiments.
- Feet must be completely covered during lab – **no open toed shoes** (sandals, flip-flops or the like).
- If an accident occurs, notify your lab instructor immediately.
- Do not run or throw anything in the lab.
- You **must** read the lab and procedure **prior to class**, as part of safety preparation. Failure to do so will result in an F for the particular lab you are unprepared for.
- Always listen carefully to your lab instructor for safety precautions and procedure Modifications.
- **All chemical waste must be disposed of properly.** Your instructor will provide you with specific instructions at the beginning of each lab regarding how to handle the chemical waste for that experiment.
- **Failure to adhere to any of the above safety guidelines will result in points being deducted from your lab report and may result in your removal from the lab and an automatic failure for that experiment.**

### **Chemistry 102.1 Grading Rubric**

**Lab Notebook:** You must obtain a carbonless organic chemistry notebook, as all your work will be recorded in this notebook and graded by its clarity and accuracy.

**Assessment:** Lab instructors will assess students by grading both of their online and in person assignments. In person instructors will collect lab notebooks, collecting laboratory products and assessing them for yield and purity and accuracy of reported results in the student notebook. In addition, students will be observed during lab, and assessed based on their technique and adherence to safety rules.

### Grade Breakdown

|                               |     |
|-------------------------------|-----|
| Lab reports and lab notebooks | 50% |
| 6 lab quizzes                 | 20% |
| Lab techniques                | 15% |
| Lab final                     | 15% |

Your notebook must include the following components for each experiment:

1. Experiment: title, date performed and Purpose of lab
  2. Introduction: In this section you should summarize the objective of the experiment in your own words. Include any chemical formulas, structures, equation, and reactions. Any relevant ideas regarding the experiment should also be written here.
  3. Procedure: You will not be allowed to use your lab book during class. Summarize the procedure in the notebook in your own words. It must be clear and detailed enough, so you can follow it and perform the experiment based on your write-up. This can be written as a step by step, or a “shopping list” type. As long as it is detailed enough for you to perform the whole experiment without any additional resources.
  4. Safety: Outline the chemicals used in this lab. their MSDS importance and safety precaution, as well as disposal of waste must be looked up and summarized. You can find the MSDS information by going to ChemWatch website at: <http://jr.chemwatch.net/chemwatch.web>.
    - Account: *queensmsds*
    - Username: *everyone*
    - Password: *eqkq+2SFEI4=*
  5. Datasheet: Create a clear data sheet in your notebook. This may be the same data sheet from the book but must be copied to the notebook and not paste on it. Be sure that any tables should be drawn using a ruler.
  6. Conclusion / Discussion: Summarize your data, explain whether you were successful in the experiment, and any errors that may have occurred.
- Note that 1-5 (Pre-lab and an empty data sheet ready to fill out in your notebook) should be done **before** you attend lab. The instructor will check your notebook prior to the beginning of the lab and initial it. Failure to complete the notebook will result in a zero for the lab, and you will not be allowed to perform the experiment that day.
  - Your notebook will be collected at the completion of every 2 labs. You will have to submit the completed labs to your instructor. These will be graded but will not be returned to you. You will get the grade from the instructor and may review it.
  - All laboratory experiments are to be performed **individually** (and evaluated by your instructor). There are **no** team experiments unless your instructor decided to do so. Each person registered for lab is to perform each laboratory experiment individually. You will be graded on your class performance, and it is 15 percent



of your lab grade. Class performance includes your lab techniques, efficiency of work, safety, independence, and cleaning of station as well as disposal of waste.

**The criteria for Performance in the Laboratory:**

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]. You **MUST** 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.
4. **Cleanness:** cleaning of workbench, hood, and common chemical, balance, and waste areas & disposal of waste.

- You are scheduled to take 6 quizzes and a final exam. The quizzes are not cumulative and will include questions of the previous lab and the lab to be performed on the day of the quiz.
- The final exam will include conceptual and procedural questions from the variety of experiments done in class, and different questions pertaining to labs. There is no option for a make - up final exam. You must attend the exam as scheduled on this syllabus, not as per CUNYFirst.

**Important note on missed classes, late work**

Attendance in the laboratory is mandatory.

Students must report to the lab on time.

There are no make-up labs, any missed labs (for a valid reason – illness, verified by a note from a registered physician; court appearance, verified by a note from an officer of the court; death in the family) will be excused with proper documentations. 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 with a valid reason. 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.

**Reasonable Accommodations for Students With Disabilities**

Students with disabilities needing academic accommodation should register with the Special Services Office by emailing [QC.SPSV@qc.cuny.edu](mailto: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>

### 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 ACS Guidelines provided by the [American Chemical Society](#).

### Class Schedule

This schedule is subject to change. Students will be notified in writing of such changes.

Class Schedule and lab sequence to be determined with Professor Choi and Professor [your name] and the tentative schedule appears below:

| Week | Date   | Experiment                                                                      | Page     |
|------|--------|---------------------------------------------------------------------------------|----------|
| 1    | 30-Aug | Check-in. Review of safety rules and instruction for waste disposal.            |          |
| 2    | 6-Sep  | <b>Experiment 1</b> Isolation of pure acetylsalicylic acid from aspirin tablets | Hand out |
| 3    | 13-Sep | <b>Experiment 2:</b> Molecular Models (Quiz 1)                                  | 239      |
| 4    | 20-Sep | <b>Experiment 3:</b> Identification of Hydrocarbons                             | 289      |
| 5    | 27-Sep | <b>Experiment 4:</b> Chromatography (Quiz 2)                                    | 275      |
| 6    | 4-Oct  | <b>Experiment 5:</b> Identification of Alcohols and Phenols                     | 301      |
| 7    | 11-Oct | <b>Experiment 6:</b> Identification of Aldehydes and Ketones (Quiz 3)           | 313      |
| 8    | 18-Oct | <b>Experiment 7:</b> Carboxylic Acids and Esters                                | 329      |
| 9    | 25-Oct | <b>Experiment 8:</b> Amines and Amides (Quiz 4)                                 | 341      |
| 10   | 1-Nov  | <b>Experiment 9:</b> Preparation of Aspirin                                     | 365      |
| 11   | 8-Nov  | <b>Experiment 10:</b> Isolation of Caffeine from Tea Leaves (Quiz 5)            | 377      |
| 12   | 15-Nov | <b>Experiment 11:</b> Carbohydrates                                             | 389      |
| 13   | 29-Nov | <b>Experiment 12:</b> Preparation of Hand Cream (Quiz 6)                        | 423      |
| 14   | 6-Dec  | Check-out: Final                                                                |          |

**Chemistry and Biochemistry Department, Queens College - CUNY**

**CHEM 1131- General Chemistry I Laboratory (Spring 2023)**

**Course Section and Code #: 7/25644**

**Instructor's Full Name:** Dr Hannah Ariel

**Instructor's Email:** hannah.ariel40@qc.cuny.edu

**Instructor's Office Hour:** 12-1 p.m. Thursdays

**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. Seogjoo J. Jang ([seogjoo.jang@qc.cuny.edu](mailto:seogjoo.jang@qc.cuny.edu))

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

**Syllabus**

**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 and 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)** Average of the grade of all attended labs (**no lab grade is dropped from the calculation except for the case of excused absence**) and counts **85% of your final lab grade**.

Each lab is graded for 100 points distributed as follows:

- 10% Prelab Questions - to be completed in the Blackboard
- 10% Prelab write-up (handwritten) in lab notebook – to be checked during each lab by the instructor
- 60% Lab Report – to be uploaded in the Blackboard
- 20% Performance in the Laboratory

**(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, 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]. 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.

(vii) 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>

(viii) 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](mailto:counselingservices@qc.cuny.edu)

(ix) 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 (7/31) 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 (9/7/) Exp. 1 Density

Week 3 (9/14) Exp. 2 Hydrate

Week 4 (9/21) Exp. 3 Precipitation

Week 5 (9/28) Exp. 4 Iron-Copper (II) Sulfate Redox

Week 6 (10/5) Exp. 5 Qualitative Study of Redox

Week 7 (10/12) Exp. 6 Copper Cycle

Week 8 (10/19) Exp. 7 Molar Mass of a Metal

Week 9 (10/26) Exp. 8 Dilution

Week 10 (11/2) Exp. 9 KHP Titration

Week 11 (11/9) Exp. 10 FAS Titration

Week 12 (11/16) Exp. 11 Calorimetry I and II

Week 13 (11/30) Exp. 12 Heat of Neutralization

Week 14 (12/7) Review for Lab

Final and Check-out

Lab Final Quiz (Check cunyfirst  
for the date)

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

**Chem 251.1****Lab Schedule, Remsen Annex 351****Fall 2023****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, 7<sup>th</sup> ed.  
 Cengage Learning, 2017, ISBN: 978-1-305-57719-0

**Chem 251.1 Section Number: 3****Lab Instructor: Prof. J. Eduardo Ocando****Instructor's Email:** [jocando@qc.cuny.edu](mailto:jocando@qc.cuny.edu)**Lab Instructor's Office Hour: W 5:30PM RE351**

Lab coat, safety goggles, and required glassware are provided upon check-in.

**Coordinator:** Prof. William H. Hersh ([william.hersh@qc.cuny.edu](mailto:william.hersh@qc.cuny.edu))**[Note: Students should contact their lab instructor for all lab-related questions.]*****All experiments to be done are the Macroscale version.***

| Week | Experiment                                                                                                                                                                             | Williamson & Masters Chp (Page)              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| 1    | Check-in. No laboratory work can be done. Review of safety in the Orgo. Lab., Instructions on disposal of chemical waste, Lab. protocols, Maintenance of a laboratory note-book        | Chp 1-2                                      |
| 2-3  | I. Melting Point Determination<br>Determination of Boiling Point via Distillation and via Micro Boiling Point Method                                                                   | Chp 3 (48-55)<br>Chp 5 (87)<br>Chp 3 (55-60) |
| 4    | II. Isolation of Clove Oil from Cloves                                                                                                                                                 | Chp 6 (103), Exp 5                           |
| 5    | II (continued). Extraction: Isolation of Eugenol from Clove Oil.<br>Thin Layer Chromatography of Clove Oil and of Eugenol<br>(Instructor will cut TLC strips and provide instructions) | Continues p112-114                           |
| 6    | III. Crystallization<br>i. Isolation of Crystalline Acetylsalicylic Acid from Aspirin tablets (Lab Notes)<br>ii. Recrystallization of Benzil (Lab Notes)                               | Lab Notes<br>Chp 4 (82-3)                    |
| 7    | IV. Preparation of Cyclohexene                                                                                                                                                         | Chp 19 (336)                                 |
| 8    | V. Preparation of 1-Bromobutane                                                                                                                                                        | Chp 16 (313)                                 |
| 9    | VI. Nucleophilic Substitution Reactions of Alkyl Halides                                                                                                                               | Chp 17 (320)                                 |
| 10   | VII. Oxidation of Cyclohexanol                                                                                                                                                         | Chp 22 (358), Exp 4                          |
| 11   | VIII. Grignard Reaction: Preparation of Triphenylmethanol                                                                                                                              | Chp 38 (493),<br>Exp 4-7                     |
| 12   | Complete VIII.<br>IX. Reactions of Triphenylmethanol – Parts 1, 2, and 3                                                                                                               | Chp 33 (447)<br>Exp 1-3                      |
| 13   | Finish IX and any other unfinished experiments                                                                                                                                         |                                              |
| 14   | Check out and Lab Final Exam. No laboratory work can be done.                                                                                                                          |                                              |

***It is important that you check the Chemistry 251 “Lab Notes” 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 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 digital lab textbook.**

**Do not bring food, 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 book (Report: 35%, Results, 35%).

15% - Performance in the Laboratory (see below).

15% - A written 1 hour lab final given on the last day of lab class (Check Out) or possibly during Finals week. The lab final 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 [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 (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.

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

**Chem 251.1****Lab Schedule, Remsen Annex 351****Fall 2023****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, 7<sup>th</sup> ed.  
 Cengage Learning, 2017, ISBN: 978-1-305-57719-0

**Chem 251.1 Section Number: 6****Lab Instructor: Prof. J. Eduardo Ocando****Instructor's Email:** [jocando@qc.cuny.edu](mailto:jocando@qc.cuny.edu)**Lab Instructor's Office Hour: W 5:30PM RE351**

Lab coat, safety goggles, and required glassware are provided upon check-in.

**Coordinator:** Prof. William H. Hersh ([william.hersh@qc.cuny.edu](mailto:william.hersh@qc.cuny.edu))**[Note: Students should contact their lab instructor for all lab-related questions.]*****All experiments to be done are the Macroscale version.***

| Week | Experiment                                                                                                                                                                             | Williamson & Masters Chp (Page)              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| 1    | Check-in. No laboratory work can be done. Review of safety in the Orgo. Lab., Instructions on disposal of chemical waste, Lab. protocols, Maintenance of a laboratory note-book        | Chp 1-2                                      |
| 2-3  | I. Melting Point Determination<br>Determination of Boiling Point via Distillation and via Micro Boiling Point Method                                                                   | Chp 3 (48-55)<br>Chp 5 (87)<br>Chp 3 (55-60) |
| 4    | II. Isolation of Clove Oil from Cloves                                                                                                                                                 | Chp 6 (103), Exp 5                           |
| 5    | II (continued). Extraction: Isolation of Eugenol from Clove Oil.<br>Thin Layer Chromatography of Clove Oil and of Eugenol<br>(Instructor will cut TLC strips and provide instructions) | Continues p112-114                           |
| 6    | III. Crystallization<br>i. Isolation of Crystalline Acetylsalicylic Acid from Aspirin tablets (Lab Notes)<br>ii. Recrystallization of Benzil (Lab Notes)                               | Lab Notes<br>Chp 4 (82-3)                    |
| 7    | IV. Preparation of Cyclohexene                                                                                                                                                         | Chp 19 (336)                                 |
| 8    | V. Preparation of 1-Bromobutane                                                                                                                                                        | Chp 16 (313)                                 |
| 9    | VI. Nucleophilic Substitution Reactions of Alkyl Halides                                                                                                                               | Chp 17 (320)                                 |
| 10   | VII. Oxidation of Cyclohexanol                                                                                                                                                         | Chp 22 (358), Exp 4                          |
| 11   | VIII. Grignard Reaction: Preparation of Triphenylmethanol                                                                                                                              | Chp 38 (493),<br>Exp 4-7                     |
| 12   | Complete VIII.<br>IX. Reactions of Triphenylmethanol – Parts 1, 2, and 3                                                                                                               | Chp 33 (447)<br>Exp 1-3                      |
| 13   | Finish IX and any other unfinished experiments                                                                                                                                         |                                              |
| 14   | Check out and Lab Final Exam. No laboratory work can be done.                                                                                                                          |                                              |

***It is important that you check the Chemistry 251 “Lab Notes” 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 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 digital lab textbook.**

**Do not bring food, 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  $\frac{3}{4}$  x 7  $\frac{1}{2}$  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 book (Report: 35%, Results, 35%).

15% - Performance in the Laboratory (see below).

15% - A written 1 hour lab final given on the last day of lab class (Check Out) or possibly during Finals week. The lab final 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 [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 (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.

## BIOCHEMISTRY LABORATORY (CHEMISTRY 376) – FALL 2023

**FRIDAYS** Recitation: 8:15 – 9:05 AM LAB: 9:15 AM – 1:05PM Remsen 355  
Instructor: Dr. Preeni Abeyweera ([tpabeyweera@gmail.com](mailto:tpabeyweera@gmail.com))

| DATE       | Laboratory Exercise                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8/25 – 9/1 | Bioinformatics - handout (2 Weeks)<br>1) Find databases and analyze a DNA sequence<br>2) Sequence homology, plasmids & cloning<br><a href="http://www.sumanasinc.com/webcontent/animations/content/plasmidcloning.html">http://www.sumanasinc.com/webcontent/animations/content/plasmidcloning.html</a><br>3) Compare and identify related protein sequences; multiple sequence alignment<br>4) <i>Problem-based learning module: In silico analysis of DNA and protein sequences.</i><br>From 5 unknown sequences, determine segments having sequence homology, use BLAST to validate existence, identify putative proteins |
| 9/8        | Plasmid isolation and restriction analysis (Week 1); see Lab Manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 9/22       | Plasmid restriction analysis by agarose gel electrophoresis (Week 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 9/29       | Computer-based analysis of plasmid fragments (Week 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10/6       | The basics of primer design for PCR<br>PCR analysis of gene expression in cells (RT-PCR);<br><a href="https://www.youtube.com/watch?v=QwT-Tj89VLo">https://www.youtube.com/watch?v=QwT-Tj89VLo</a>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10/13      | Separation of proteins by chromatography<br>Size exclusion chromatography; analysis of data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 10/20      | Affinity chromatography: Isolation and assay of lactate dehydrogenase ((Week 1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 10/29      | Protein assay of column fractions (Week 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 11/3       | SDS-PAGE of column fractions (Week 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11/10      | Enzyme Kinetics – Week 1 assays of glucose oxidase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 11/17      | Enzyme Kinetics – Week 2 assays of glucose oxidase; analysis of data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 12/1       | Introduction to Molecular Modelling -Week 1: Analysis of protein structure (pyMOL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 12/8       | Introduction to Molecular Modelling - Week 2: Analysis of protein structure (pyMOL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

### REVIEW

**Note that there will be no classes on September 15th and November 25<sup>th</sup>.**

**ASSESSMENT** For each lab exercise, a formal written report or set of responses to on-line exercises will be due 1 week following the conclusion of each module. Quizzes will be given at the discretion of the instructor. The course grade will be based on: Reports (40%), Final Exam (30%), Quizzes (25%), and Participation (5%).  
A final exam will be given at a date and time to be announced.

**PUBLIC HEALTH AND SAFETY POLICY** For in-person lab exercises, everyone is required to wear a mask, gloves, and a disposable lab coat. Students will be spaced 6-feet apart to maintain social distancing. Participants will have their temperature checked each time.  
Students at risk or with health concerns that may not meet the technical requirements of the ADA, may request that they participate only in on-line exercises by writing the Lab Coordinator ([Susan.Rotenberg@qc.cuny.edu](mailto:Susan.Rotenberg@qc.cuny.edu))

and providing documentation from a health care practitioner. If permission is granted, students are responsible for the material and will be required to view the instructional video and to analyze pre-formulated data.

### **REASONABLE ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

Students with disabilities needing academic accommodation should register with the Special Services Office by emailing [QC.SPSV@qc.cuny.edu](mailto:QC.SPSV@qc.cuny.edu).

For more information about services available to Queens College students, visit the Office of Special Services: <https://www.qc.cuny.edu/studentlife/services/specialserv/Pages/default.aspx>.

### **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/>.

### **ONLINE ETIQUETTE**

Please maintain a professional demeanor when posting online. You can be respectful even when you have a difference of opinion. Treat others as you'd want to be treated yourself. Don't type in all caps, as that is the online equivalent of shouting. If you need to emphasize a word or phrase, use italics.

*Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.*

### **COUNSELING SERVICES**

Counseling Services are 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](mailto:counselingservices@qc.cuny.edu).

8/17/2023

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

**Chem 102.3****Lecture Schedule****Fall 2023****Course Requirements:**

102.3: C or better in Chem 101.3 and 101.1, or C or better in Chem 113.4 and 113.1

Pre or corequisite: Chem 102.1 (C or better if prerequisite)

*Note: a C- in any prerequisite will not permit you to take 102.3/102.1!*

You must earn a C or better in Chem 102.3 and 102.1 to take Chem 103.3 and 103.1

*Note: If you are a transfer student with a CR in a prerequisite course but your earned grade was a C- or less, there is a strong likelihood that you will not pass 102.3.*

You will need access to Blackboard for exams and handouts, including this syllabus. It is your responsibility to provide a valid e-mail address that you monitor. Announcements will be made via Blackboard and e-mail. While the timing has not yet been announced, there may be a switch from Blackboard to a new system called Brightspace during the semester (or even just before the semester starts).

**Lecture: Mon., Wed. 3:10 - 4:25 PM, Remsen 101. I am normally available after class if you have questions.**

**Professor William H. Hersh**

**Office Hour\*:**

**Monday 1:00 PM - 1:30 PM** *(on-line tentatively using Blackboard Collaborate Ultra - please use video for this half of Office Hour so I can get to know who you are!)*

**Monday 1:30 PM - 2:00 PM** in Remsen 109

and by appointment if you have class or work scheduled Monday 1-2 PM.

*\*This is an experiment - last year's class when surveyed split evenly on wanting in-person vs. on-line office hour, so I am trying this to start.*

**Telephone: 718-997-4144**

**e-mail: [william.hersh@qc.cuny.edu](mailto:william.hersh@qc.cuny.edu) - best way to contact me**

**LECTURE TEXT (required):** *General, Organic, & Biological Chemistry*, 5<sup>th</sup> Edition, Janice Smith (McGraw Hill, ISBN: 9781264247974). This is the same book used for Chem 101 (since Sp 2023) and 103 going forward, so plan ahead when buying or renting – ebook and a looseleaf version are available.

The text contains many problems - you should do those that appear in the body of the text and at the end of each chapter. These problems will not be graded, and there is no on-line homework for this course. Answers to all problems may be found at the end of each chapter, but don't look at the answers when you try to answer the problems; if you can't answer the problem, go to the relevant part in the chapter to help figure it out.

***If you want to understand the lecture material, you must read the textbook chapter before class. For the vast majority of students, it is not possible to understand lecture material if you are seeing it for the first time in class! When you read the textbook and do problems in the text with the reading, read slowly - do not read it like a novel if you hope to learn the material.***

***Final piece of advice for how to succeed in organic: ATTEND EVERY CLASS! Attendance has been highly correlated with passing the course with a grade of C or higher.***

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

LAB TEXT (Required): *Laboratory Experiments for Introduction to General, Organic and Biochemistry*, F. Bettelheim and J. Landesberg, 8<sup>th</sup> Edition, Brooks/Cole, 2013

|          |                           |      |
|----------|---------------------------|------|
| Grading: | 4 75-minute Midterm Exams | 72%  |
|          | Final Exam                | 28%  |
|          | Total                     | 100% |

**Exams will stress lecture material, problems in the book, and recitation problems.  
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 Dr. Hersh 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 a midterm exam, written verification of your reason for missing the exam is required. There are no make-up exams; your midterm grade 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.

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#### Approximate Lecture and Examination Schedule

| Approximate Lectures and Examination Schedule                 |                              |                                                           |
|---------------------------------------------------------------|------------------------------|-----------------------------------------------------------|
| Date                                                          | Chp                          | Topic                                                     |
| Aug. 28                                                       | 11                           | Introduction to Organic Molecules and Functional Groups   |
| Sept. 13                                                      | 12                           | Alkanes                                                   |
| Sept. 20                                                      | 13                           | Unsaturated Hydrocarbons                                  |
| <b>Sept. 27</b>                                               | <b>Exam 1 Chapters 11-12</b> |                                                           |
| Oct. 4                                                        | 14                           | Organic Compounds That Contain Oxygen, Halogen, or Sulfur |
| Oct. 18                                                       | 15                           | The Three Dimensional Shape of Molecules                  |
| <b>Oct. 23</b>                                                | <b>Exam 2 Chapters 13-14</b> |                                                           |
| Oct. 30                                                       | 16                           | Aldehydes and Ketones                                     |
| Nov. 13                                                       | 17                           | Carboxylic Acids, Esters, and Amides                      |
| <b>Nov. 15</b>                                                | <b>Exam 3 Chapters 15-16</b> |                                                           |
| Nov. 29                                                       | 18                           | Amines and Neurotransmitters                              |
| <b>Dec. 11</b>                                                | <b>Exam 4 Chapters 17-18</b> |                                                           |
| <b>Dec 18 or 20 (tentative), Final Exam: Chapters 11 – 18</b> |                              |                                                           |

**No class Monday Sept. 4, Sept. 25, October 9**

**Tuesday October 10 is a Monday schedule**

**No class Wednesday Nov. 22**

**Reading Day Dec 12-13.**

**Course Objectives:** Students will learn basic structural organic chemistry, including structures and nomenclature of hydrocarbons and compounds containing the most common functional groups including halides, alcohols, thiols and disulfides, amines, carbonyl compounds including aldehydes, ketones, carboxylic acids, esters, and amides. Stereochemistry will be introduced, and students will learn to draw structures and convey three-dimensional information about structures. Reactions of these compounds will be introduced, but mechanisms of reactions, synthesis, and spectroscopy will not be covered in this course. At the conclusion, students will have a foundation that will allow them to enter a course in basic molecular biochemistry.

**Assessment:** Problem solving ability will be tested using exams; while memorization of naming conventions and reactions will be required, the emphasis will be on understanding structures of organic compounds. 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.** This course is not graded on a curve. Everyone in the class can get an A, or everyone can get an F. There is no predetermined percentage of the class that will get any particular grade. The key for all exams is shown below, except for + and – cutoffs. For instance, while “A” is shown as 80-100, an average of 80 will be an A-, and while “B” is shown as 60-79, the cutoffs are approximately 1/3 in each range, i.e. around 60-66 B-, 67-73 B, 74-79 B+. The exact ranges will not be given out except for the C cutoff, since you need a C to go on to Chem 103.

**Chem 102 exam and course grade key:**

80-100 A  
60-79 B  
47-59 C  
40-46 C-  
30-39 D  
0-29 F

**Queens College of the City University of New York**  
**Department of Chemistry and Biochemistry**  
**Basic Organic Chemistry**  
**Chen-- Lecture Schedule**

**Chem 102.3****Fall 2023****Course Requirements:**

102.3: C or better in Chem 101.3 and 101.1, or C or better in Chem 113.4 and 113.1

Pre or corequisite: Chem 102.1 (C or better if prerequisite)

*Note: a C- in any prerequisite will not permit you to take 102.3/102.1!*

You must earn a C or better in Chem 102.3 and 102.1 to take Chem 103.3 and 103.1

*Note: If you are a transfer student with a CR in a prerequisite course but your earned grade was a C- or less, there is a strong likelihood that you will not pass 102.3.*

You will need access to Blackboard for exams and handouts, including this syllabus. It is your responsibility to provide a valid e-mail address that you monitor. Announcements will be made via Blackboard and e-mail. While the timing has not yet been announced, there may be a switch from Blackboard to a new system called Brightspace during the semester (or even just before the semester starts).

**Lecture: Wed. 6:30 - 9:20 PM, Remsen 017. Basement Location****Professor Yu Chen****Office Hour\*:****Wednesday 5:30 PM – 6:20 PM Remsen Hall 206.**e-mail: [yu.chen1@qc.cuny.edu](mailto:yu.chen1@qc.cuny.edu)

**LECTURE TEXT (required):** *General, Organic, & Biological Chemistry*, 5<sup>th</sup> Edition, Janice Smith (McGraw Hill, ISBN: 9781264247974). This is the same book used for Chem 101 (since Sp 2023) and 103 going forward, so plan ahead when buying or renting – ebook and a looseleaf version are available.

<https://qc.textbookx.com/institutional/index.php?action=browse#books/3857261/>

The text contains many problems - you should do those that appear in the body of the text and at the end of each chapter. These problems will not be graded, and there is no on-line homework for this course. Answers to all problems may be found at the end of each chapter, but don't look at the answers when you try to answer the problems; if you can't answer the problem, go to the relevant part in the chapter to help figure it out.

***If you want to understand the lecture material, you must read the textbook chapter before class. For the vast majority of students, it is not possible to understand lecture material if you are seeing it for the first time in class! When you read the textbook and do problems in the text with the reading, read slowly - do not read it like a novel if you hope to learn the material.***

***Final piece of advice for how to succeed in organic: ATTEND EVERY CLASS! Attendance has been highly correlated with passing the course with a grade of C or higher.***

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

LAB TEXT (Required if you're also taking the separate laboratory course): *Laboratory Experiments for Introduction to General, Organic and Biochemistry*, F. Bettelheim and J. Landesberg, 8<sup>th</sup> Edition, Brooks/Cole, 2013

|                 |                                  |             |
|-----------------|----------------------------------|-------------|
| <b>Grading:</b> | <b>3 75-minute Midterm Exams</b> | <b>54%</b>  |
|                 | <b>ALEKS homework</b>            | <b>16%</b>  |
|                 | <b>Final Exam</b>                | <b>30%</b>  |
|                 | <b>Total</b>                     | <b>100%</b> |

**Exams will stress lecture material, problems in the book, and recitation problems.**

**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 need any special services during the exams, contact Dr. Chen as soon as possible. If you have any questions concerning the grading, contact Dr. Chen within 10 days following the exam.

**If you miss a midterm exam, written verification of your reason for missing the exam is required. There are no make-up exams; your midterm grade 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.

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**Approximate Lecture and Examination Schedule**


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| Date                              | Chp     | Topic                                                                                                      |
|-----------------------------------|---------|------------------------------------------------------------------------------------------------------------|
| Aug. 30                           | 11      | Syllabus and Introduction to Organic Molecules and Functional Groups                                       |
| Sept. 6                           | 11      | Introduction to Organic Molecules and Functional Groups                                                    |
| Sept. 13                          | 12      | Alkanes                                                                                                    |
| Sept. 20                          | 13      | Unsaturated Hydrocarbons                                                                                   |
| <b>Sept. 27</b>                   | 14      | Organic Compounds That Contain Oxygen, Halogen, or Sulfur<br><b>Exam 1 Chapters 11-13 (Time 8:00-9:15)</b> |
| Oct. 4                            | 14      | Organic Compounds That Contain Oxygen, Halogen, or Sulfur                                                  |
| Oct. 11                           | 14 & 15 | Org. Cmpnds That Contain Oxygen, Halogen, or Sulfur & The Three Dimension Shape of Molecules               |
| Oct. 18                           | 15      | Three Dimension Shape of Molecules                                                                         |
| Oct. 25                           | 16      | Aldehydes and Ketones                                                                                      |
| <b>Nov. 1</b>                     | 16      | Aldehydes and Ketones <b>Exam 2 Chapters 14-15 (Time 8:00-9:15)</b>                                        |
| Nov. 8                            | 17      | Carboxylic Acids, Esters, and Amides                                                                       |
| Nov. 15                           | 17 & 18 | Carboxylic Acids, Esters, and Amides and Amines and Neurotransmitters                                      |
| Nov. 29                           | 18      | Amines and Neurotransmitters                                                                               |
| <b>Dec. 6</b>                     |         | Recitation and <b>Exam 3 Chapters 16-18 (Time 6:30-7:45)</b>                                               |
| <b>Dec 20</b>                     |         | <b>Final Exam: Chapters 11 – 18</b>                                                                        |
| <b>No class Wednesday Nov. 22</b> |         |                                                                                                            |
| <b>Reading Day Dec 12-13.</b>     |         |                                                                                                            |

**Course Objectives:** Students will learn basic structural organic chemistry, including structures and nomenclature of hydrocarbons and compounds containing the most common functional groups including halides, alcohols, thiols and disulfides, amines, carbonyl compounds including aldehydes, ketones, carboxylic acids, esters, and amides. Stereochemistry will be introduced, and students will learn to draw structures and convey three-dimensional information about structures. Reactions of these compounds will be introduced, but mechanisms of reactions, synthesis, and spectroscopy will not be covered in this course. At the conclusion, students will have a foundation that will allow them to enter a course in basic molecular biochemistry.

**Assessment:** Problem solving ability will be tested using exams; while memorization of naming conventions and reactions will be required, the emphasis will be on understanding structures of organic compounds. 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.** This course is not graded on a curve. Everyone in the class can get an A, or everyone can get an F. There is no predetermined percentage of the class that will get any particular grade.

**Chem 102 exam and course grade key:**

85-100 A  
 80-84 A-  
 75-79 B+  
 65-74 B  
 60-64 B-  
 55-59 C+  
 45-54 C  
 35-44 D  
 0-34 F

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

**Chem 251.1****Lab Schedule, Remsen Annex 351****Fall 2023****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, 7<sup>th</sup> ed.  
 Cengage Learning, 2017, ISBN: 978-1-305-57719-0

**Chem 251.1 Section Number:****Lab Instructor:****Instructor's Email:****Lab Instructor's Office Hour (on-line or in-person):**

Lab coat, safety goggles, and required glassware are provided upon check-in.

**Coordinator:** Prof. William H. Hersh ([william.hersh@qc.cuny.edu](mailto:william.hersh@qc.cuny.edu))**[Note: Students should contact their lab instructor for all lab-related questions.]*****All experiments to be done are the Macroscale version.***

| Week | Experiment                                                                                                                                                                             | Williamson & Masters Chp (Page)              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| 1    | Check-in. No laboratory work can be done. Review of safety in the Orgo. Lab., Instructions on disposal of chemical waste, Lab. protocols, Maintenance of a laboratory note-book        | Chp 1-2                                      |
| 2-3  | I. Melting Point Determination<br>Determination of Boiling Point via Distillation and via Micro Boiling Point Method                                                                   | Chp 3 (48-55)<br>Chp 5 (87)<br>Chp 3 (55-60) |
| 4    | II. Isolation of Clove Oil from Cloves                                                                                                                                                 | Chp 6 (103), Exp 5                           |
| 5    | II (continued). Extraction: Isolation of Eugenol from Clove Oil.<br>Thin Layer Chromatography of Clove Oil and of Eugenol<br>(Instructor will cut TLC strips and provide instructions) | Continues p112-114                           |
| 6    | III. Crystallization<br>i. Isolation of Crystalline Acetylsalicylic Acid from Aspirin tablets (Lab Notes)<br>ii. Recrystallization of Benzil (Lab Notes)                               | Lab Notes<br>Chp 4 (82-3)                    |
| 7    | IV. Preparation of Cyclohexene                                                                                                                                                         | Chp 19 (336)                                 |
| 8    | V. Preparation of 1-Bromobutane                                                                                                                                                        | Chp 16 (313)                                 |
| 9    | VI. Nucleophilic Substitution Reactions of Alkyl Halides                                                                                                                               | Chp 17 (320)                                 |
| 10   | VII. Oxidation of Cyclohexanol                                                                                                                                                         | Chp 22 (358), Exp 4                          |
| 11   | VIII. Grignard Reaction: Preparation of Triphenylmethanol                                                                                                                              | Chp 38 (493),<br>Exp 4-7                     |
| 12   | Complete VIII.<br>IX. Reactions of Triphenylmethanol – Parts 1, 2, and 3                                                                                                               | Chp 33 (447)<br>Exp 1-3                      |
| 13   | Finish IX and any other unfinished experiments                                                                                                                                         |                                              |
| 14   | Check out and Lab Final Exam. No laboratory work can be done.                                                                                                                          |                                              |

***It is important that you check the Chemistry 251 "Lab Notes" 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 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 digital lab textbook.**

**Do not bring food, 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  $\frac{3}{4}$  x 7  $\frac{1}{2}$  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 book (Report: 35%, Results, 35%).

15% - Performance in the Laboratory (see below).

15% - A written 1 hour lab final given on the last day of lab class (Check Out) or possibly during Finals week. The lab final 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 [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 (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.

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

Chem 251.4

Fall 2023

**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 Blackboard for handouts, including this syllabus, and for office hour if you want on-line office hour. It is your responsibility to provide a valid e-mail address that you monitor. Announcements will be made via Blackboard and e-mail. While the timing has not yet been announced, there may be a switch from Blackboard to a new system called Brightspace during the semester (or even just before the semester starts).

**Lecture:** Tu, Thurs 2:15 - 4:05 PM, Remsen 101. There will be a 10 minute break and I am available then and normally after class if you have questions.

Professor William H. Hersh

Office Hour\*:

Thursday 10:00 AM - 10:30 AM *(on-line tentatively using Blackboard Collaborate Ultra - please use video for*

*this half of Office Hour so I can get to know who you are!)*

Thursday 10:30 AM - 11:00 AM in Remsen 109

and by appointment if you have class or work scheduled Thursday 10-11.

*\*This is an experiment - last year's class when surveyed split evenly on wanting in-person vs. on-line office hour, so I am trying this to start.*

Telephone: 718-997-4144

e-mail: [william.hersh@qc.cuny.edu](mailto:william.hersh@qc.cuny.edu) - best way to contact me

**LECTURE TEXT and on-line Achieve Homework (Required):** *Organic Chemistry*, 7<sup>th</sup> Ed., Loudon and Parise (2021). **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).**

The Achieve Link for this course is <https://achieve.macmillanlearning.com/courses/pmnx9s>

If you are asked for the course code, it is pmnx9s

Achieve will be active on August 1. You will have access to the E-book for 4 years, and to Achieve assignments for the number of terms you buy – two terms recommended if you will take Chem 252 Spring 2023.

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 EITHER OF THE 2 ISBN'S:**

<https://store.macmillanlearning.com/us/product/Organic-Chemistry/p/9781319481353>

for the 2-term Achieve+E-book AND paperback Study Guide and Solutions Manual, \$142.99

**(STRONGLY RECOMMENDED)**

**There are 2 ISBN's for this item, but they get to the same page:** 9781319481346 & 9781319481353  
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, \$129.99

**There are 2 ISBN's for this item, but they get to the same page:** 9781319481322 & 9781319481339

If you already have the Study Guide and Solutions Manual for the 7th edition, there is no need to purchase - there is just one version.

Other options on the Macmillan site can be found at:

<https://store.macmillanlearning.com/us/product/Organic-Chemistry/p/1319188427>

For instance you can buy the loose-leaf version of the text+Achieve (two terms), the paperback version of the text+Achieve (two terms), and there are packages with the Study Guide/Solutions Manual as well as rentals (and if

you rent, you must send the book back after the rental period, otherwise there are fees). All of these packages that include the Study Guide will be more expensive than the above \$129.99 or \$142.99 special package.

2. QC bookstore, one or two term Achieve (includes E-book) and the Study Guide/Solutions Manual (**strongly recommended**): \$129.99/142.99 (for one or two terms).

ISBN 9781319481322 (one term) or ISBN 9781319481346 (two terms).

3. QC bookstore, one or two term Achieve (includes E-book): about \$100/115 (for one or two terms)

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

***If you want to understand the lecture material, you must read the textbook chapter before class. For the vast majority of students, it is not possible to understand lecture material if you are seeing it for the first time in class! When you read the textbook and do problems in the text with the reading, plan for a pace of about 4 pages/hour. Do not read it like a novel if you hope to learn the material.***

***Final piece of advice for how to succeed in organic: ATTEND EVERY CLASS! Attendance has been highly correlated with passing the course with a grade of C or higher.***

**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.

The Achieve Link for this course is <https://achieve.macmillanlearning.com/courses/pmnx9s> (same as above).

You can probably find it by searching for Hersh or Queens College or CUNY, but you will be using this constantly.

**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). I believe you will like this part of the Achieve system, and since it is new, feel free to let me know if you find it helpful or not.

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, and on the day we do recitation problems for the chapter in class. 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://macmillan.force.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)

LAB TEXT (Required): *Macroscale and Microscale Organic Experiments*, Williamson and Masters, 7<sup>th</sup> ed.

Cengage Learning, 2017, ISBN: 978-1-305-57719-0 (hard copy or e-book).

***Do NOT get the newer 8<sup>th</sup> edition.***

|          |                                            |             |
|----------|--------------------------------------------|-------------|
| Grading: | 3 1 hour Midterm Exams                     | 60%         |
|          | On-line Achieve Adaptive pre-class Quizzes | 10%         |
|          | On-line Achieve after-lecture homework     | 5%          |
|          | Final Exam                                 | 25%         |
|          | <b>Total</b>                               | <b>100%</b> |

The midterm exams will be given at the beginning of the class, followed by a break and a 30 minute lecture (approximately) after each of the midterm exams. The final (2 hour) exam will be similar to the midterm exams.

**Exams will stress lecture material and recitation problems.**

**Bring photo ID to exams.**

**You will be allowed to bring only to the Midterm Exams (not the Final Exam) an 8.5x11 inch "help" sheet – fill in both sides as you wish. No magnifying glass allowed. They will not be collected.**

You *will* be permitted to use molecular models during exams. You will *not* be permitted to use books, notes (except for the help sheet on the midterms, but *not* the final), computers, or calculators during exams. Cell phones are strictly prohibited during exams. If you have any questions concerning the grading, contact Dr. Hersch 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 a midterm exam, written verification of your reason for missing the exam is required. There are no make-up exams; your midterm grade 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.

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#### Approximate Lecture and Examination Schedule

| Date                                                          | Chp                           | Topic                                                  | Suggested Chapter-End Problems                     |
|---------------------------------------------------------------|-------------------------------|--------------------------------------------------------|----------------------------------------------------|
| Aug. 29                                                       | 1                             | Bonding and Structure                                  | 43-46, 48-50, 52-58, 64-65                         |
| Aug. 31                                                       | 2                             | Alkanes                                                | 25, 28-36, 44-45, 54-55                            |
| Sept. 12                                                      | 3                             | Acids and Bases, Curved Arrows                         | 40-48, 56a, 57, 59-62, 64, 66, 68a                 |
| Sept. 19                                                      | 4                             | Intro to Alkenes and Alkynes: Structure and Reactivity | 43-51, 53-62a, 63-64, 67, 72-77, 79-84             |
| <b>Sept. 28</b>                                               | <b>EXAM 1 Chapters 1-3</b>    |                                                        |                                                    |
| Oct. 3                                                        | 5                             | Addition Reactions of Alkenes and Alkynes              | 21-33, 35, 36, 39, 40-43                           |
| Oct. 19                                                       | 6                             | Stereochemistry                                        | 28-37, 39, 41-43, 45                               |
| Oct. 26                                                       | 7                             | Cyclic Compounds, Reaction Stereochemistry             | 32-40, 42-44a, 46, 50, 52-55, 60, 67-70, 76-78, 83 |
| <b>Nov. 2</b>                                                 | <b>Exam 2 Chapters 4 – 6</b>  |                                                        |                                                    |
| Nov. 2                                                        | 8                             | Noncovalent Intermolecular Interactions                | 31, 32, 36, 39-41, 44, 45, 48, 50, 52, 55, 56, 58  |
| Nov. 7                                                        | 9                             | Alkyl Halides, Substitution and Elimination            | 35-37, 39-54, 57, 60-65, 70, 71, 77                |
| Nov. 21                                                       | 10                            | Free Radicals, Organometallics, Carbenes               | 35, 36, 39, 41, 42, 44, 47-50, 60, 68              |
| <b>Nov. 30</b>                                                | <b>Exam 3 Chapters 7 – 10</b> |                                                        |                                                    |
| Nov. 30                                                       | 11                            | Alcohols and Thiols                                    | 41, 43-52, 57-66, 68-70, 73-76, 80                 |
| <b>Dec 14 or 19 (tentative), Final Exam: Chapters 1 – 11.</b> |                               |                                                        |                                                    |

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**No class Monday Sept 25 and October 9**

**Tuesday October 10 is a Monday schedule**

**No classes Wed. through Friday Nov. 22-24.**

**Reading Day Dec 12-13.**

**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 match the topics with those in your textbook. Once you start Chem 251, read the book before lecture (yes, I did say this already up above!); 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. In most cases hiring a tutor will not help and most likely will be a hindrance because you will rely on the tutor rather than yourself.

**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.** This course is not graded on a curve. Everyone in the class can get an A, or everyone can get an F. There is no predetermined percentage of the class that will get any particular grade. The key for all exams is shown below, except for + and – cutoffs. For instance, while “A” is shown as 80-100, an average of 80 will be an A-, and while “B” is shown as 65-79, the cutoffs are approximately 1/3 in each range, i.e. around 65-69 B-, 70-74 B, 75-79 B+. The exact ranges will not be given out except for the C cutoff, since you need a C to go on to further chemistry courses.

The ranges given will never be raised, but they have on occasion been lowered if a test was too hard.

80-100 A

65-79 B

55-64 C

50-54 C-

40-49 D

0-39 F

# CHEM 331.3/710, Adv. Inorg. Chem, Fall 2023

## I. Lecture Instructor Information

**Instructor:** Prof. Chen Wang      **Office:** REM 120B

**Email:** [chen.wang@qc.cuny.edu](mailto:chen.wang@qc.cuny.edu)

**Office Hours:** Fri 10:00 AM - 12:00 PM or by appointment

## II. Course Information

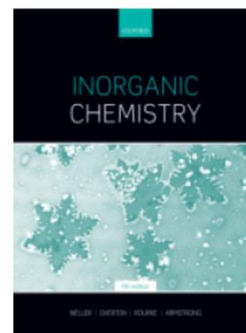
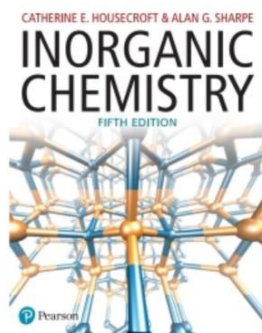
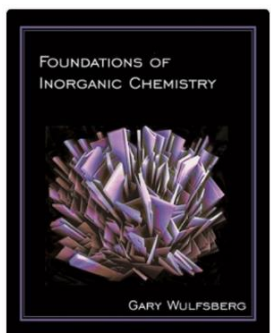
**Lecture Times:** Tu, F 12:15PM - 1:30PM    **Classroom:** REM 105

**Course Description:** This course will discuss periodic trends across the entire periodic table in the category of acid-base chemistry, coordination (complex-ion) chemistry, precipitation chemistry, and oxidation-reduction chemistry. Principles that help explain these trends in chemical reactivity will also be discussed. Symmetry and molecular orbital theory will be introduced after you have developed an understanding of fundamental trends across the periodic table, which allows molecular orbital theory to be more broadly applied in subsequent chapters. This course is not only to chemistry students, but also to other professionals in other fields of science in which inorganic chemistry has become important. There is no physical chemistry prerequisite, but a background in General Chemistry, and enrollment in a Foundations of Organic Chemistry course are assumed.

## III. Books and Materials

**Textbook:** Foundations of Inorganic Chemistry 1<sup>st</sup> Edition by Gary Wulfsberg

**Other Suggested References:** Inorganic Chemistry by Catherine Housecroft; Inorganic Chemistry by Mark Weller, Tina Overton, Jonathan Rourke, and Fraser Armstrong



### **Important Notes:**

- The course materials (including the lecture slides and recorded lectures) and assignments will be posted on Blackboard.
- No material (now or in the future) obtained from this course can be distributed, sold, or purchased.
- There will be no extensions on the assignments.

#### **IV. Grading and Evaluation**

The grade is a 10-point grade scale as shown in Official Queens College Grade Scale (<https://www.qc.cuny.edu/academics/supportprograms/advising/academic-and-grading-policies/Pages/Default.aspx>).

| Grades | GPA    | Numerical Value / Definition                                               |
|--------|--------|----------------------------------------------------------------------------|
| A+     | 97-100 | 4.0 (GPA in Good Academic Standing)                                        |
| A      | 93-96  | 4.0                                                                        |
| A-     | 90-92  | 3.7                                                                        |
| B+     | 87-89  | 3.3                                                                        |
| B      | 83-86  | 3.0                                                                        |
| B-     | 80-82  | 2.7                                                                        |
| C+     | 77-79  | 2.3                                                                        |
| C      | 73-76  | 2.0                                                                        |
| C-     | 70-72  | 1.7 (GPA in Academic Probation)                                            |
| D+     | 67-69  | 1.3                                                                        |
| D      | 60-66  | 1.0 (Grade of D is the lowest passing grade in the undergraduate division) |
| F      | 0-59   | 0.0                                                                        |

**The final course grade will be calculated based on:**

|                       |                                                                                                                                                                                                                                                                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5% Participation      | <ul style="list-style-type: none"><li>You must attend class <b>ON TIME</b>. Excessive absences and tardiness will affect your grade.</li></ul>                                                                                                                                                                                            |
| 25% Mid-term          | <ul style="list-style-type: none"><li>One mid-term exam will cover the material for Chapter 1-6. Questions will be based on topics covered in the lecture and homework.</li><li><b>There will be no make-up mid-term exams.</b></li></ul>                                                                                                 |
| 40% Final             | <ul style="list-style-type: none"><li>There will be one comprehensive final exam that covers all chapters, with emphasis on the contents from Chapter 7-12 (~80%). Questions will be based on topics covered in the lecture and homework.</li></ul>                                                                                       |
| 30% (5% × 6) Homework | <ul style="list-style-type: none"><li>Roughly one homework will cover two chapters.</li><li>Homework will be announced in class and posted on Blackboard.</li><li>Homework will be due in one week at the beginning of the class. <b>Late homework will not be accepted.</b></li><li><i>Exams may be based on the homework.</i></li></ul> |

#### **V. Tentative Class Schedule**

**This schedule may be subject to change.**

| Date  | Chapter # | Topic                      |
|-------|-----------|----------------------------|
| 08/25 | --        | Introduction to the course |

|              |            |                                                                          |
|--------------|------------|--------------------------------------------------------------------------|
| 08/29, 09/01 | Chapter 1  | Periodic Trends in Fundamental Properties of Atoms and Simple Ions       |
| 09/5, 09/8   | Chapter 2  | Monatomic Ions and Their Acid–Base Reactivity                            |
| 09/12, 09/19 | Chapter 3  | Polyatomic Ions: Their Structures and Acid–Base Properties               |
| 09/22, 09/26 | Chapter 4  | <u>Ionic Compounds in the Solid State</u> , in Minerals, and in Solution |
| 09/29, 10/03 | Chapter 5  | Trends in Coordination Equilibria                                        |
| 10/06, 10/13 | Chapter 6  | Principles of Oxidation–Reduction Reactivity                             |
| 10/17        | --         | Review Session 1                                                         |
| 10/20        | --         | Mid-term Exam                                                            |
| 10/24, 10/27 | Chapter 7  | Introduction to Transition Metal Complexes                               |
| 10/31, 11/03 | Chapter 8  | <u>Oxides and Silicates</u> as Materials                                 |
| 11/07, 11/10 | Chapter 9  | The Underlying Reasons for Periodic Trends                               |
| 11/14, 11/17 | Chapter 10 | Symmetry                                                                 |
| 11/21, 11/28 | Chapter 11 | Molecular Orbital Theory                                                 |
| 12/01, 12/05 | Chapter 12 | The Elements as Molecules and <u>Materials</u>                           |
| 12/08        | --         | Review Session 2                                                         |
| TBD          | --         | Final exam                                                               |

## **VI. College Policies and Student Services**

**Reasonable Accommodations for Students with Disabilities:** Any student who feels that he or she may need accommodation based upon the impact of a disability should contact me privately. Please contact the office of Services for Students with Disabilities at Room 111, Frese Hall, 718-997-5870 (QC.SPSV@qc.cuny.edu) to coordinate reasonable accommodation for students with documented disabilities. See: <https://www.qc.cuny.edu/sp/>

**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/reference_list_electronic_sources.html) ([https://owl.purdue.edu/owl/research\\_and\\_citation/apa\\_style/apa\\_formatting\\_and\\_style\\_guide/reference\\_list\\_electronic\\_sources.html](https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/reference_list_electronic_sources.html)).

Students should complete their assignments and exams independently. Plagiarism or any other forms of cheating is **NOT** tolerated. Any assignment involved will receive a grade of zero. Students plagiarizing will receive a warning for the first time. The second time that a student is caught will result in the automatic failure of the course. Other penalties, and/or referral to the Chairman and the Dean may be carried out.

**Statement on student wellness:** As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. QC services are available free of charge. You can learn more about confidential mental health services available on campus at:

<https://www.qc.cuny.edu/StudentLife/services/counseling/counseling/>

**Use of Student Work:** All programs in New York State undergo periodic reviews by accreditation agencies. For these purposes, samples of student work are occasionally made available to those professionals conducting the review. Anonymity is assured under these circumstances. If you do not wish to have your work made available for these purposes, please let the professor know before the start of the second class. Your cooperation is greatly appreciated.



## 1. Lecture Instructor Information

Lecturer: Dr. Sheila Sanders  
Office: Remsen 206-D (Chemistry & Biochemistry Department)  
Office Hours: Tu 12:30 – 1:30 pm or appointment by email  
Contact: [ssanders@qc.cuny.edu](mailto:ssanders@qc.cuny.edu)  
(every effort will be made to respond by email within 24 hrs)

## 2. Course Information & Description

Lecture Times: In-Person  
Tu & Th, 9:15 – 10:30 am, Remsen 017

Recitation Times: In-Person  
Tu 3:50 – 4:40 pm, Remsen 105 De Soyza  
Th 11:10 am – 12:00 pm, Remsen 105 Sangiorgi

Items Required: Internet Access, Google Chrome, CUNYfirst account, CUNY Blackboard, Office 365, scientific non-graphing calculator, ALEKS access card for on-line assignments  
Textbook: Chemistry, 14<sup>th</sup> edition by Overby and Chang. The eBook is available with purchase of the on-line assignments.

GENERAL Chemistry 114.4 is the second semester of a two-semester science majors/pre-health professions level introductory college chemistry course. The lecture meets for 4 credit hours weekly (actually two 75-minute periods per week) and the recitation meets for one 50-minute period weekly. The laboratory course 114.1 is a separate co-requisite for chemistry 114.4 and is administered and graded separately. This course is required for more advanced study in chemistry, biochemistry, and biology. It is intended for students in the physical and life sciences, science education, pre-health professional students, and pre-engineering students and is designed to provide a thorough knowledge of facts and theory in the fundamental areas of chemistry. As appropriate, topics are presented in terms of contemporary scientific issues such as global warming, energy production, and hazardous waste. The relationship between chemistry and society is discussed. This course requires a large quantity of work in ALEKS.



Learning Objectives:

- Develop an understanding of intermolecular forces
- Understand quantitative aspects of phase changes
- Interconvert concentration units
- Understand colligative properties of solutions
- Determine the extent of chemical reactions
- Solve problems involving rates and mechanisms of chemical reactions
- Identify and solve problems involving acids and bases
- Solve equilibrium problems
- Develop an understanding of chemical change and electrical work

### 3. Grading Policy & Types of Assignments

Official Queens College Grade Scale:

<https://www.qc.cuny.edu/Academics/SupportPrograms/advising/Academic-and-Grading-Policies/Pages/Default.aspx>

15% ALEKS Homework: Aleks homework should be completed one week after we cover the full chapter in lecture; however, the official due date is Dec. 14<sup>th</sup>. After every few modules, there may be a “*Post Objective Progress Assessment*” – **Do not click “I don’t know” unless you don’t know. This will set you back. There will be no extensions.**

50% Exams: Mid-term exams will be based on topics covered in lecture and recitation. The format may be a combination of the following: *Multiple Choice, Fill in the blank, Definitions, Short Response and Long Answer Calculations*. Exams are given **in-person** at the beginning of lecture. **There are no make-up exams.**

25% ACS-style Final: The American Chemical Society-style examination is a 50 – 60 question multiple choice comprehensive examination. It will be given **in-person** at the end of the semester. Check cunyfirst for the final exam date and time.

10% Recitation Quizzes: Recitation quizzes will be based on topics covered in recitation. The format may be a combination of the following: *Multiple Choice, Fill in the blank, Definitions, Short Response and Long Answer Calculations*. Quizzes will be given **in-person** at the beginning of the Recitation session. **There are no make-up quizzes.**

**4. \*Tentative Lecture Schedule**

| Date      |  | Topic                            |  |  |
|-----------|--|----------------------------------|--|--|
| Tu,8/29   |  | Introduction                     |  |  |
| Th,8/31   |  | Chapter 11 Intermolecular Forces |  |  |
| Tu,9/5    |  | Chapter 11 Intermolecular Forces |  |  |
| Th,9/7    |  | Chapter 12 Solutions             |  |  |
| Tu,9/12   |  | Chapter 12 Solutions             |  |  |
| Th,9/14   |  | Chapter 13 Kinetics              |  |  |
| Tu,9/19   |  | Chapter 13 Kinetics              |  |  |
| Th,9/21   |  | Chapter 13 Kinetics              |  |  |
| Tu,9/26   |  | <b>Exam # 1</b>                  |  |  |
| Th,9/28   |  | Chapter 14 Equilibrium           |  |  |
| Tu,10/3   |  | Chapter 14 Equilibrium           |  |  |
| Th, 10/5  |  | Chapter 14 Equilibrium           |  |  |
| Th, 10/12 |  | Chapter 15 Acids and Bases       |  |  |



|          |  |                                                                 |  |
|----------|--|-----------------------------------------------------------------|--|
| Tu,10/17 |  | Chapter 15 Acids and Bases                                      |  |
| Th,10/19 |  | Chapter 15 Acids and Bases                                      |  |
| Tu,10/24 |  | Chapter 16 Acid-Base<br>Equilibria and Solubility<br>Equilibria |  |
| Th,10/26 |  | Chapter 16 Acid-Base<br>Equilibria and Solubility<br>Equilibria |  |
| Tu,10/31 |  | Chapter 16 Acid-Base<br>Equilibria and Solubility<br>Equilibria |  |
| Th,11/2  |  | Chapter 16 Acid-Base<br>Equilibria and Solubility<br>Equilibria |  |
| Tu, 11/7 |  | <b>Exam # 2</b>                                                 |  |
| Th, 11/9 |  | Chapter 17 Entropy,<br>Gibbs Energy, and<br>Equilibrium         |  |



|                          |  |                                                   |  |
|--------------------------|--|---------------------------------------------------|--|
| Tu, 11/14                |  | Chapter 17 Entropy, Gibbs Energy, and Equilibrium |  |
| Th, 11/16                |  | Chapter 17 Entropy, Gibbs Energy, and Equilibrium |  |
| Tu, 11/21                |  | Chapter 18 Electrochemistry                       |  |
| Th, 11/23                |  | No Class                                          |  |
| Tu, 11/28                |  | Chapter 18 Electrochemistry                       |  |
| Th, 11/30                |  | Chapter 18 Electrochemistry                       |  |
| Tu, 12/5                 |  | <b>Exam # 3</b>                                   |  |
| TBA<br>(Check CUNYfirst) |  | <b>Final Exam</b>                                 |  |



The schedule is tentative; the instructor will notify students in writing of any changes.

The final exam will be a comprehensive 2-hour American Chemical Society-Style exam.

Any changes to the exam dates will be announced in class at least 1 week in advance. There will be no make-up exams.

## 5. How to access ALEKS

For this course you will be required to purchase McGraw-Hill Education **ALEKS Access** for Chemistry, 14<sup>th</sup> edition by Overby and Chang. You are not required to have a print text and please be aware if you purchase a used textbook you will still need to purchase access to ALEKS (which includes access to the eBook).

### How to access Aleks HW:

Go to the Content section of Blackboard and click on the Queens ALEKS Chemistry link ([www.ALEKS.com](http://www.ALEKS.com)) and log in (if you've used ALEKS before) or click the 'New Student? Sign Up

Now' Button in yellow. Then enter course code: **AMJ6A – DA9AK** and click 'Continue'. Check that the section is correct, if so, click 'Continue' again. Choose 'I have never used ALEKS before or I do not have an ALEKS login name' and 'Continue'. Enter your ALEKS Registration Code (provided on access card shipped to you, after purchasing from the QC Online Bookstore), enter the code and click 'Continue'. If you haven't received your Registration Cards yet, you can use the Financial Aid Access Code, **D597A-FD9CE-FB66A-7907E**, but **be sure to purchase access at above immediately, as it will take 7-10 business days to ship**. Complete the remaining steps to finish registering for ALEKS.



## 6. Important Notes

- This course requires a large quantity of work in ALEKS.
- Please purchase the Aleks homework as soon as possible (**within the first week**). It will take a week to deliver and your courtesy access is only available for two weeks. If you are having difficulties purchasing the codes, please send me an email immediately; do not wait until your courtesy access expires. No student will be exempt from completing the ALEKS assignments.
- There will be **no** extensions on ALEKS assignments. The date is posted and set.
- There will be **no** make-ups. If you know you will miss an exam, please contact me **in advance**.
- There will be **no** extra credit provided at the end of the semester.
- An INC grade will not be given when a student is failing the course.
- Problems within and at the end of each chapter should be completed for additional practice.
- There will be **no** curve in this class.
- No material (now or in the future) obtained from this course can be distributed, sold, or purchased.

### REASONABLE ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Students with disabilities needing academic accommodation should register with the Special Services Office by emailing [QC.SPSV@qc.cuny.edu](mailto: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>

### 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/policiesprocedures/academicintegrity-policy/>.

## Chemistry 371/650 Biochemistry I – Fall 2023

Professor Susan A. Rotenberg ([Susan.Rotenberg@qc.cuny.edu](mailto:Susan.Rotenberg@qc.cuny.edu)) Remsen 117B  
Office hour: Mondays 10AM-11AM, or by appointment

**Text:** *Lehninger's Principles of Biochemistry* (8<sup>th</sup> Edition), D.L. Nelson and M. M. Cox (2021)

**Lecture:** Tuesdays and Thursdays, 12:10PM – 2:00PM **Location:** Remsen Hall, Room 101

**Course goals/learning objectives:** Students will gain a strong foundation in the structure and function of macromolecules (carbohydrates, lipids and proteins) and how they are used as sources of energy in biological cells. In addition, students will gain an understanding of metabolic pathways and the principles of their regulation. We will explore the ways pathways are coordinated under different conditions.

| Topics                                               | Chapter(s) | Week# | Dates         |
|------------------------------------------------------|------------|-------|---------------|
| Chemical Foundations, Water                          | 1, 2       | 1     | Aug 29        |
| Amino Acids, Peptides, and Proteins                  | 3          | 2     | Aug 31, Sep 5 |
| Protein Structure, Analysis and Purification         | 3, 4       | 3, 4  | Sept 7, 12    |
| Protein Function: Hemoglobin and Allosteric Proteins | 5          | 4     | Sept 14, 19   |
| Enzyme Catalysis and Kinetics                        | 6          | 5-6   | Sept 21, 26   |

### EXAM 1 (Thursday, Sept 28)

|                                  |        |     |                |
|----------------------------------|--------|-----|----------------|
| Carbohydrates                    | 7      | 7   | Oct 3          |
| Introduction to Metabolism       | 12, 13 | 8   | Oct 5          |
| Glycolysis, Gluconeogenesis, PPP | 14     | 8-9 | Oct 12, 17, 19 |
| Glycogen Metabolism              | 15     | 10  | Oct 24, Oct 26 |
| The Citric Acid Cycle            | 16     | 11  | Oct 31, Nov 2  |

### EXAM 2 (Tuesday, Nov 7)

|                                                      |       |    |                |
|------------------------------------------------------|-------|----|----------------|
| Electron Transport and Oxidative Phosphorylation     | 19    | 12 | Nov 9, Nov 14  |
| Lipids and Cell Membranes                            | 10    | 13 | Nov 16         |
| Lipid Metabolism                                     | 17    | 13 | Nov 21, Nov 28 |
| Amino Acid Metabolism                                | 18    | 14 | Nov 30, Dec 5  |
| Metabolic Inter-Relationships; Fed vs. Fasted States | Notes | 14 | Dec 7          |

### EXAM 3 (Thursday, Dec 14; 11AM – 1PM in Remsen 101)

**SCHEDULE CHANGES** No classes will be held on Tuesday, October 10<sup>th</sup> (Monday schedule), and Thursday, Nov 23<sup>rd</sup>.

### GRADING

Chem 371 students: Each exam counts as 30% and quizzes will count as 10% of the final grade.

Chem 650 students: Each of the three exams will count as 30%. Students are required to write a 5-8 page paper that will count 10% towards their final grade.

**MAKEUP POLICY** In general, there will be **no** makeup exams given. The only acceptable excuse is if you provide **written documentation** of serious illness, accident, or family-related death. If you miss more than one exam, you must arrange to re-take the test when the course is offered again.

**REASONABLE ACCOMMODATIONS FOR STUDENTS WITH 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>.

**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/>.

**COUNSELING SERVICES**

Counseling Services are 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](mailto:counselingservices@qc.cuny.edu).

8/23/2023

## **CHEM 341.1 & CHEM 790.1- Instrumental Methods & Basic Techniques for Research in Analytical and Physical Chemistry Laboratory**

**Lecture Hour:** Tu, 1:50 -2:40 PM, 354 RE

**Experimental:** Tu, 2:50 - 5:40 PM, 354 RE

### **SYLLABUS**

**I. Text:** D. A. Skoog, F. J. Holler, and S. R. Crouch, *Principles of Instrumental Analysis*, 7<sup>th</sup>ed. Cengage Boston 2018 (or any edition) ISBN: 9781305577213

Bishop, Robert H. *LabVIEW Student Edition* Pearson New York 2015 ISBN: 9780134011332 **or** another LabVIEW equivalent text

**II. Other Required Materials:** Scientific calculator, bound laboratory notebook, USB flash drive, safety goggles, lab coat

### **III. Some Suggested Reference Sources:**

Harris *Quantitative Chemical Analysis, seventh (or any) ed.* W. H. Freeman and Company New York 2001

Garland, Nibler, Shoemaker *Experiments in Physical Chemistry, seventh ed. (or any)* McGraw-Hill New York 2003

Atkins, de Paula *Physical Chemistry, ninth ed. (or any)* W. H. Freeman and Company New York 2002

Bishop *Learning with LabVIEW 8* Prentice-Hall New York 2006

Travis, Kring *LabVIEW for Everyone: Graphical Programming Made Easy and Fun, 3rd Edition* Prentice-Hall New York 2006

**IV.Attendance:** Both laboratory and lecture (recitation) sessions are required. Excessive absence or tardiness adversely affects your grade. Class participation positively affects your grade. The last meeting **is mandatory**. If you miss a lab day, consult with me **and** your groupmates, if any.

**V. Safety:** **Goggles**, long pants or skirts, closed toe shoes, and long hair tied back are required. Eating, drinking, gum chewing, horseplay, stunt experiments, and contact lenses are not allowed; wear glasses to lab if needed. 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, and you may be ejected from lab and receive a zero (0) for that experiment.**

**VI. Course Grade:** The course grade will be based on the total points of all assignments and quizzes, as stated above, which will constitute 85% of the grade, the remaining 15% will be from performance in the laboratory, the grand total, minus any deductions for safety infractions, will be used to determine the letter grade for the course; all as mentioned above in § X.A.1-5.

**VII. Schedule:** *Schedule is subject to change as semester progresses.*

| <u>Week</u> | <u>Dates</u> |                                                                      |                |                |                | <u>Due Date</u>     |              |
|-------------|--------------|----------------------------------------------------------------------|----------------|----------------|----------------|---------------------|--------------|
|             |              | <u>Group 1</u>                                                       | <u>Group 2</u> | <u>Group 3</u> | <u>Group 4</u> |                     |              |
| 1           | 8/29         | Introduction- Check-in; Safety Lecture; Lab Reports and Syllabus:    |                |                |                |                     |              |
| 2           | 9/5          | <u>Lab 1</u>                                                         | <u>Lab 2</u>   | Lab 7          | Lab 9          | 9/19, <u>9/26</u>   |              |
| 3           | 9/12         | 1                                                                    | 2              | 7              | 9              |                     |              |
| 4           | 9/19         | 1                                                                    | 2              | Lab 5          | Lab 4          | 9/26                |              |
| 5           | 9/26         | <u>Lab 2</u>                                                         | <u>Lab 1</u>   | Lab 4          | Lab 5          | 10/3, <u>10/24</u>  |              |
| 6           | •10/3        | <u>QUIZ 1</u>                                                        | 2              | 1              | <u>Lab 9</u>   | <u>Lab 7</u>        | <u>10/24</u> |
| 7           | 10/17        | 2                                                                    | 1              | 9              | 7              |                     |              |
| 8           | 10/24        | Lab 4                                                                | Lab 5          | <u>Lab 1</u>   | <u>Lab 2</u>   | 10/31, <u>11/14</u> |              |
| 9           | 10/31        | Lab 5                                                                | <u>Lab 7</u>   | 1              | 2              | 11/7, <u>11/14</u>  |              |
| 10          | 11/7         | <u>Lab 9</u>                                                         | 7              | 1              | 2              | <u>11/21</u>        |              |
| 11          | 11/14        | 9                                                                    | Lab 4          | <u>Lab 2</u>   | <u>Lab 1</u>   | 11/21, <u>12/5</u>  |              |
| 12          | •11/21       | <u>QUIZ 2</u>                                                        | <u>Lab 7</u>   | <u>Lab 9</u>   | 2              | 1                   | <u>12/5</u>  |
| 13          | 11/28        | 7                                                                    | 9              | 2              | 1              |                     |              |
| 14          | 12/5         | REQUIRED ATTENDANCE- Final papers due, Checkout; Cleanup- all groups |                |                |                | n/a                 |              |

**Experiment List**

| <u>Lab #</u> | <u>Title</u>                                                         |
|--------------|----------------------------------------------------------------------|
| 1            | Programming a NXT LEGO Mindstorms Robot with LabVIEW                 |
| 2            | Building a Digital Thermometer Using a DAQ in LabVIEW                |
| 4            | IR Spectroscopy: Determination of Xylenes Using an Internal Standard |
| 5            | Fluorescence Determination of Quinine in Tonic Water                 |
| 7            | Identification of Some Constituents Using HPLC                       |
| 9            | Separation and Identification of Some Constituents Using ESI-MS      |

**VIII. Work in the Laboratory**

**A. Safety-** Observe all safety protocols, use caution; see § V, VI above and X.A.5 below.

**B. Equipment Usage-** You will likely be assigned to work with other students in small groups or teams on the same experiment or equipment. However, your submissions to me are to be solely your own. You must leave the equipment and work areas at the end of the lab period clean and neat; again, observe safety protocols. Put away all glassware, other equipment, and chemicals after use. When finished with an analytical instrument, **do not turn off the computer;** simply leave it on, or at most, log out of it. See § VIII. D, below.

### VIII. C. Code of Conduct

1. **Plagiarism-** Plagiarism or any other form of cheating is not tolerated. The student perpetrating such an act will receive a zero (0) for the assignment in question and a warning, along with other possible penalties, for a first offense. A second offense by the student will result in automatic failure of the course (F) and referral to the Chairman and/or the Dean. A failure to properly cite any sources, including figures, charts, tables, and artwork, in a submission or work is also considered plagiarism.
2. **Laboratory Conduct-** No horseplay. No offensive language. No other activities in the laboratory or classroom that are not relevant to the coursework. Return all items used to proper places, keep equipment and work areas clean and neat. Strictly observe all safety protocols.

**D. Lab Computers** - The computers in the laboratory are for use with the experiments and related work. They are **not** for personal recreational use. When finished for the day, please leave on, *maybe* log off but **do not shut down**.

### X. Work to Be Submitted

#### A. Grading

1. **All Reports-** Hard copies are due on the dates listed above. Each is graded for completeness and succinctness of content, clarity and effectiveness of presentation, and proper formatting on the basis of 100 points. Be aware that the experiment schedules differ for different groups.
  - a. **Three-Week Reports-** There are two, and together are to be 32% of grade total.
  - b. **Two-Week Reports-** There are two, and together are to be 22% of grade total.
  - c. **One-Week Reports-** There are two, and together weighted 12% of grade total.
2. **Notebooks-** will be sporadically checked; points deducted at my discretion, if not properly used and maintained, and weighted to be 5% of grade total.
3. **Quizzes-** There will be two, on the material presented in our lecture (recitation) hour, and together will be 14% of your grade total.
4. **Laboratory Performance-** will be subjectively evaluated by me and weighted to be 15% of grade total.
5. **Safety-** Violations of safety rules will result in points deducted from course total at my discretion.
3. **FOR Chem 790.1 ONLY- tentatively** the above comprises 40% of your total course grade as for you lab and lecture are (60%) one course. *This proportion may change, contingent on lecture exam grades through semester.*

## X. B. Report Structure

1. **Format-** Reports must be written in the style of a scientific journal article. Refer to ACS or APS style guides, or to examples in papers published in chemistry or physics journals.
  - a. **Heading-** title, author(s: your name, name of people in your group), department and college
  - b. **Abstract-** This one very short paragraph summing up the whole paper.
  - c. **Introduction-** Explain what the various approaches that can be taken to perform the experiment and any theoretical and background information. The last paragraph should describe the procedure and objective.
  - d. **Experimental section-** describe what you did– you may insert figures, graphs, references, tables, if this will better elucidate your text.
  - e. **Results-** include data here. While the original data is to be recorded in your lab notebook, they must be reproduced in this section of the paper.
    - i. **Calculations** - do include figures (graphs, charts, diagrams) and tables.
    - ii. **Error Analysis-** Discuss your calculations, accuracy, including error analysis. Error analysis should be included for all calculations.
  - f. **Discussion-** What do your results mean? (This is where you make your scientific conclusions.)
  - g. **Conclusions or Summary-** This is more than just a simple synopsis. What is noteworthy or can be learned from the work?
  - h. **References-** Reference citations are to be listed in this section, with the annotation superscripts in appropriate places throughout the paper. **Do NOT use Internet sources** for your citations. Use actual scientific literature, as peer-reviewed journals, textbooks, etc. (Of course, you may use the Internet to locate, for example, a journal article or book.)
2. **Submission of Reports**
  - a. Hard copies of assignments must be submitted for credit and are due on the scheduled dates, unless otherwise scheduled or notified.
  - b. **Do not** submit your papers late; late papers are **not acceptable and will receive a zero (0) score.**
  - c. **Electronic copies must also be submitted, but are not acceptable for credit.**
  - d. If you miss an entire experiment due to absence, it may be made up. See me for the possibility of making up the experiment.

**XI. Communication:** I can be reached preferably via our BlackBoard discussion group and secondarily via e-mail, but only for messages that require some privacy. You may ask questions, discuss course topics, and answer each other's questions, too! (I will check the answers.) Course materials, this syllabus, and ancillary materials will be posted on Blackboard.

**CHEM 341.3 & 790.1 secs. 1- Instrumental Methods & Basic Techniques for  
Research in Analytical and Physical Chemistry Laboratory**

Tuesdays, Thursdays, 9:30-10:45 AM; room 105 RE

**SYLLABUS**

**I. Required Text:** D. A. Skoog, F. J. Holler, and S. R. Crouch, *Principles of Instrumental Analysis*, 7<sup>th</sup> ed. Cengage Boston **2018** ISBN: 9781305577213

**II. Suggested References:** Garland, Nibler, Shoemaker *Experiments in Physical Chemistry*, seventh ed. (or any) McGraw-Hill New York 2003 **(On reserve in Rosenthal Library)**  
Atkins, de Paula *Physical Chemistry*, ninth ed. (or any) W. H. Freeman and Company New York 2002 **(On reserve in Rosenthal Library)**

**III. Attendance:** Attendance is required; *do not come late*; your grade may be adversely affected.

**IV. Homework:** Problem( set)s will be randomly scheduled on BlackBoard. A penalty of a 10% credit loss per day will be imposed on late homework; submissions past 6 days late will not be accepted. You may work together on the homework but submissions must be original and not copied from another individual. If duplicate work is received, no credit will be given.

**V. Examinations:** There will be two required in-class tests and one comprehensive final examination. **Make-ups are discouraged** as rescheduling is very difficult; see me first. You may **not miss** the final exam; missing or failing the final results in **F** for the course. There may also be randomly scheduled quizzes throughout the semester; they will not be announced prior to their occurrence.

**VI. Other Required Materials:** You will need to provide your own *scientific* calculator.

**VII. Code of Conduct**

**A. Plagiarism-** Plagiarism or any other form of cheating is not tolerated. Any student perpetrating such will receive a zero (0) for the assignment in question and a warning and/or referral to the Chairman and/or the Dean, along with other possible penalties. A next offense will **include also automatic failure of the course (F)**.

**B. In-Class Conduct-** Inappropriate behavior, *e.g.*, off-color language, also will not be tolerated and will lead to expulsion from class and a zero (0) if during an examination or assignment. **Cellphone, tablet and computer usage is not permitted at any time during exams**.

**VIII. Grading:** The two in-class exams together comprise 30% of your course grade, as do any randomly scheduled quizzes and homework, and the final exam is 40%. Positive class participation may increase your final course grade.

**IX. Communication:** Contact me via our discussion group on BlackBoard; use e-mail only for messages that need to be less public. This syllabus and any ancillary materials will be posted on Blackboard.

**X. Course Schedule:** *(Topics, times subject to change; course may run ahead or behind this timetable.)*

| <u>Week</u> | <u>Dates</u> | <u>Topic</u>                                           | <u>Chapter</u> |
|-------------|--------------|--------------------------------------------------------|----------------|
| 1           | 8/29         | Introduction to Instrumental Analysis                  | 1              |
|             | 8/31         | Signals and Noise                                      | 5              |
| 2           | 9/5          | Introduction to Spectroscopy                           | 6              |
|             | 9/7          | Components of Optical Instruments                      | 7              |
| 3           | 9/12         | Molecular Spectroscopy: UV-Vis Spec'y                  | 13             |
|             | 9/14         | Molecular Spectroscopy: UV-Vis Spec'y                  | 14             |
| 4           | 9/19         | Molecular Spectroscopy: Luminescence Spec'y            | 15             |
|             | 9/21         | Molecular Spectroscopy: Luminescence Spec'y            | 15             |
| 5           | 9/26         | Molecular Spectroscopy: Infrared Spec'y                | 16             |
|             | 9/28         | Molecular Spectroscopy: Infrared Spec'y                | 17             |
| 6           | 10/3         | <b><u>EXAM 1</u></b>                                   |                |
|             | 10/5         | Molecular Spectroscopy: Raman Spec'y                   | 18             |
| 7           | 10/12        | Molecular Spectroscopy: Raman Spec'y                   | 18             |
|             | 10/17        | Introduction to Separation Science 1                   | 26             |
| 8           | 10/19        | Introduction to Separation Science 1                   | 26             |
|             | 10/24        | Gas Chromatography                                     | 27             |
| 9           | 10/26        | High Performance Liquid Chromatography                 | 28             |
|             | 10/31        | High Performance Liquid Chromatography                 | 28             |
| 10          | 11/2         | Principles of Mass Spectrometry                        | 11             |
|             | 11/7         | Design of Mass Spectrometry                            | 11             |
| 11          | 11/9         | Applications of Mass Spectrometry                      | 20             |
|             | 11/14        | Applications of Mass Spectrometry                      | 20             |
| 12          | 11/16        | <b><u>EXAM 2</u></b>                                   |                |
|             | 11/21        | Introduction to Electroanalytical Chemistry            | 22             |
| 13          | 11/28        | Potentiometry                                          | 23             |
|             | 11/30        | Potentiometry/Coulometry                               | 23/24          |
| 14          | 12/5         | Coulometry/Voltammetry                                 | 24/25          |
|             | 12/7         | Voltammetry                                            | 25             |
| 15          | 12/14        | <b><u>FINAL EXAMINATION 8:30 – 10:30 AM RE 105</u></b> | <b>all</b>     |

# SYLLABUS FOR CHEM395W

OFFICIAL COURSE NUMBER: SENIOR THESIS

## General Information:

Queens College

Department of Chemistry and Biochemistry

Chem 395

Building and Room Number: TBA

Instructor name and contact information (office phone and e-mail address, as well e-mail policy). TBA

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## Course Description:

A senior thesis requires the permission and supervision of a faculty mentor. This course is taken by the student after completing one or more upper level (300 level) chemistry courses. Under the supervision of a faculty mentor, student chooses a research project or literature review connected to their research interests and draft a thesis. Substantial amount of time is spent in reviewing existing literature, organizing information to form a coherent narration of findings, reviewing, and revising with mentor support for language, clarity, and style expected in the scientific discipline. Upon completion of the thesis, an oral presentation is required. In addition to mentor, thesis and presentation will be graded by at least one other faculty member chosen by the mentor.

This course is writing intensive and requires 20 pages or more of scientific writing excluding figures and tables. There will be extensive revisions required by the mentor over the course of the semester before the final draft is submitted at the end of the semester. In addition, an oral presentation is required at the end of the semester.

## Textbook Information:

The ACS Style Guide: Effective Communication of Scientific Information (An American Chemical Society Publication) 3rd Edition by Anne M. Coghill (Editor), Lorrin R. Garson (Editor) ISBN: 978-0841239999

This course also uses free materials available through Queens College and CUNY library systems and course mentor's collection of research articles and books.

## Attendance Policy:

Students must meet their faculty mentor and/or other research students in the laboratory for a minimum of 3 hrs/week.

## Discipline/Course Specific Learning Objectives:

1. Search literature through online services like scifinder, google scholar, etc.
2. Request articles through online sources like library subscription.
3. Organize information from various sources used along with proper reference for using in a thesis.
4. Plan the sections and logical flow for drafting a thesis with appropriate scientific language in the discipline.
5. Write, revise, and re-revise with input from reviewer(s) for informational clarity, logical flow, and grammar.
6. Oral presentation and defending work in front of a scientific audience.

**Writing statement:**

This course is a Writing Intensive (W) course and fulfills one Writing Intensive requirement. W classes include a huge portion of time devoted to writing instruction, revision, discussions of rhetorical strategies, and reflective writing about writing assignments.

**Course Activities Calendar:**

This course requires substantial amount of independent work outside of meeting time with mentor. Topic of research and writing is primarily student's work with substantial mentor input. Hence constant meetings with mentor are necessary and a grade for attendance is suggested. However, course grading guidelines as well as written assignment guidelines are general and subject to modification by mentor as it applies to the topic and sub-discipline. A written thesis of 20+ pages and oral presentation are mandatory requirements for completing the course.

| Class Meeting | Topic                                                                                                                                                                                                                   | Readings/Assignments                                                                                                                                                                                                                                           | Objectives/<br>Criteria Met |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Week 1        | Research topic and gathering data, formulating a time map for research writing, avoiding plagiarism.<br><br>Preparing and presenting a scientific work – Using figures effectively and keeping notes to say on a topic. | Use ACS style guidebook to map out the style used in the article assigned by the mentor.<br><br>Make a list of seminars (department seminars as well as other opportunities linked to topic given outside chemistry department) to attend during the semester. |                             |

|               |                                                                                                                                                                       |                                                                                                                                                                                                                                      |                                                                                                   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Week 2        | Research writing discussion<br>Rhetorical analysis of a written review article and gathering data from papers.                                                        | Use online database(s) to get research articles and take notes from articles                                                                                                                                                         | 2 hours of writing instruction and rhetorical analysis                                            |
| Week 3        | Discussing a rough draft of thesis on the chosen topic.<br>Expanding on the article searches to gather more data necessary to complete thesis                         | Formulate a map with sections and briefs for what should go in the sections.<br>Prepare a list of major references for the topic and abstracting ideas from journals.                                                                | Additional hours of writing instruction                                                           |
| Week 4        | Discussing the first draft and plan the work.                                                                                                                         | Separate the task for writing sections and organize data                                                                                                                                                                             | Evaluated writing plan of 3 pages of more                                                         |
|               | Graded Activity [10%]                                                                                                                                                 | Prepare and submit first draft                                                                                                                                                                                                       |                                                                                                   |
| Weeks 5 to 8  | Improving the draft with feedback for each section.<br>Reflective analysis of writing and planning expanded writing                                                   | Insert figures and tables, number them, reference them in the text for clarity.                                                                                                                                                      | Evaluated writing of 5 to 10 pages of writing in the field. Reflective analysis and logical flow. |
|               | Graded Activity [10%]                                                                                                                                                 | Expand second draft with 5 to 10 pages of material                                                                                                                                                                                   |                                                                                                   |
| Weeks 9 to 12 | Improving the logical flow with introduction, data analysis, and major outcomes. Analyzing the written work for compliance with ACS style guide.                      | Submit final draft of 20+ pages of written material after substantial revisions, Submit for final evaluation by mentor at week 12                                                                                                    | Evaluation and feedback for 5000+ words of written material. Compliance to scientific style.      |
| Week 13       | Revision practices – Rereading and checking spelling, grammar, acronyms, run-on sentences, vocabulary, plagiarism, and formatting.<br>Discussion of oral presentation | Complete draft for graded thesis. Prepare oral PowerPoint presentation applying the principles learned from attending scientific presentations. Practice for content and time and follow it up with a practice in front of a mentor, | Instructions for final presentation - Oral and Written                                            |
| Week 14 -15   | Final thesis and Oral presentation                                                                                                                                    | Both mentor and another faculty member grade oral and written work*                                                                                                                                                                  |                                                                                                   |

Course Grade:

Attendance and weekly participation as laid out in the syllabus: 10%

Evaluation of first draft of work at week 4-5: 10%

Evaluation of second draft of work at week 8-9: 20%

Final draft and oral presentation: 60% [\*final draft and oral presentation are graded by mentor and at least one other faculty member chosen by the mentor. Grade is weighted equally from all these parts: (i) concise introduction that lays out the foundation and importance of the topic (ii) figures and tables uniformly referenced and referred to in the text with data analysis (iii) following the ACS style guide for all sections of material and (iv) oral presentation and defense.

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**Chemistry and Biochemistry Department, Queens College - CUNY**

**CHEM 1011- Basic Chemistry Lab (Fall 2023)**

**Section Number:** 101.1/1 [25719]

**Instructor's Full Name:** Iva Burdett

**Instructor's Email:** [iva.burdett@qc.cuny.edu](mailto:iva.burdett@qc.cuny.edu)

**Instructor's Office Hour:** Wednesdays 5:00pm-6:00pm and Thursdays 12:30pm-1:30pm

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

**Other required items:** 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 1013

**Coordinator:** Prof. Iva Burdett ([iva.burdett@qc.cuny.edu](mailto:iva.burdett@qc.cuny.edu))

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

**Syllabus**

**I. Laboratory Course Format- Hybrid**

- A. ALL In-person lab sessions will be held on Queens College campus in Remsen 151 at your scheduled time and day.
- B. Attendance is mandatory. A missed lab will receive no credit. Students must report to lab on time. There is NO make-up for any missed laboratory experiment.
- C. A lab can only be excused with documentation relating to an unplanned emergency (medical or legal) or religious observance. If you cannot attend the lab due to the COVID quarantine requirement, a COVID test record must be provided afterwards.
- D. Attendance will be taken at 1:40pm. Due to safety concerns, any student that arrive after 2:00pm will not be allowed to perform the experiment.

**II. Learning Outcomes**

**This course satisfies the following two Queens College General Education learning outcomes:**

QC 1: Address how, in the discipline (or disciplines) of the course, data and evidence are construed and knowledge is acquired; that is, how questions are asked and answered. QC 2: Position the discipline(s) in the liberal arts curriculum and the larger society

**This QC College Option SCI course satisfies the following three learning outcomes:**

SCI 1: Familiarity with a body of knowledge in the physical or biological sciences.

SCI 2: Successful study of the methods of science, including the use of observation, the information of hypotheses and the testing of models.

SCI 3: Experience and awareness of the impact of science on modern society

**This course satisfies the Life and Physical Science (LPS) requirements of the Pathways General Education Required Core**

LPS 1: Identify and apply the fundamental concepts and methods of a life or physical science.

LPS 2: Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.

LPS 3: Use the tools of a scientific discipline to carry out collaborative laboratory investigations.

LPS 4: Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.

LPS 5: Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

### **III. General Laboratory Rules**

Failure to adhere to safety guidelines may result in your removal from the lab and an automatic failure for that experiment. Always listen carefully to your lab instructor for safety precautions and procedure modifications. If an accident occurs, notify your lab instructor immediately.

- A. Always wear safety goggles.
- B. NO short pants, skirts, open toe shoes are allowed; tie back long hair; secure all loose clothing.
- C. NO food, beverages, gum, horseplay, or unauthorized experiments allowed.
- D. NO computer, tablet or cell phone use in the laboratory during class activities.
- E. Never leave a flame unattended.
- F. All chemical waste must be disposed of properly. Your instructor will provide you with specific instruction at the beginning of each lab regarding how to handle the chemical waste for that experiment.

#### IV. Laboratory Manual

A custom laboratory manual is used and is available free of charge, posted on the BlackBoard in the Content Section.

#### V. Grading:

Each lab is graded for 100 points distributed as follows - 10% Prelab Questions; 60% Lab Report; 10% Post-lab Assignments, and 20% Experimental Final Exam. **All laboratory experiments are to be performed individually (and evaluated by the instructor). There are no team experiments. Each person registered for lab is to perform each laboratory experiment individually.**

A. There are pre-labs, lab write-ups, report sheets, and post-lab questions for all experiments performed. Bring the lab write-ups for each scheduled lab. Students who fail to bring the lab write-up for the scheduled lab to class will not be permitted to enter the lab.

B. A pre-lab activity, posted on **Blackboard**, is due before the beginning of each lab. Each pre-lab is based upon the background and procedure for the lab activity to be conducted and will be available for one week prior to the scheduled lab. Before you come into class, you are required to read the laboratory procedure, as well as the background information pertaining to the lab that will be performed that day.

C. Data measured in laboratory is to be recorded directly on your report sheets. Report sheets can be located at the end of each lab write-up document (located under the content tab in Blackboard). Each student must print their own lab write-up. Report sheet will be collected at the end of each lab experiment. Failure to hand in a lab report will result in a grade of zero for that lab, which will be averaged into your overall laboratory grade.

D. Missed labs with appropriate documentation will not be counted in the final grade. The grade will be assigned based on the performance in the rest of labs. However, absence without documented excuses will result in a zero grade for that lab, which will be averaged into your overall grade. If you have attended all the labs without any **unexecuted** absences, one lowest scored lab sheet will be dropped from your final lab reports average.

E. Each lab experiment will have a post-lab activity posted on **Blackboard**. Each postlab is due before the next scheduled lab (generally one week later).

F. **Final Exam** will be conducted in person and will include an experiment each student will perform individually. The details will be uploaded to blackboard and discussed in lab prior to the date of the final exam.

## 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) 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.

(iv) COVID-19 Issues: If you have COVID-19, symptoms thereof, or otherwise ill, do not come in, stay home, seek medical advice, and inform your instructor AND coordinator ASAP.

(v) CUNY Legal Notice on Live Recordings:

When applicable: "Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live."

(vi) Available accommodation for students with learning disabilities: Candidates with disabilities needing academic accommodation should: 1) register with and provide documentation to the Special Services Office, Frese Hall, Room 111; 2) bring a letter indicating the need for accommodation and what type. **This should be done during the first week of class.** For more information about services available to Queens College candidates, visit the [website](#), or contact: Special Service Office; Director, Miriam Detres-Hickey, Frese Hall, Room 111; 718997-5870 (Monday – Thursday 8:00 a.m. to 5:00 p.m. & Friday 8:00 a.m. to 4 pm.).

(vii) 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](mailto:counselingservices@qc.cuny.edu)

(viii) 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/>. 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](#).

### **Schedule of Experiments**

| <b>Week</b> | <b>Date</b> | <b>Experiment</b>                                                       |
|-------------|-------------|-------------------------------------------------------------------------|
| 1           | 08/29/23    | Check-in, Safety Video, #1 – The Bunsen Burner                          |
| 2           | 09/05/23    | #2 – Laboratory Measurements                                            |
| 3           | 09/12/23    | #3 – Conversion Factors                                                 |
| 4           | 09/19/23    | #4 – Density                                                            |
| 5           | 09/26/23    | #5 – Determination of the formula of a Metal Oxide                      |
| 6           | 10/03/23    | #6 – Water of Hydration                                                 |
| 7           | 10/10/23    | <b>NO LAB, CLASSES FOLLOW MONDAY SCHEDULE</b>                           |
| 8           | 10/17/23    | #7 – Chemical Reactions Part 1: Combination and Decomposition Reactions |
| 9           | 10/24/23    | #8 – Chemical Reactions Part 2: Single and Double Replacement Reactions |
| 10          | 10/31/23    | #9 – Calorimetry                                                        |
| 11          | 11/07/23    | #10 – Kinetics                                                          |
| 12          | 11/14/23    | #11 – Equilibrium                                                       |
| 13          | 11/21/23    | #12 – Charles's Law                                                     |
| 14          | 11/28/23    | #13 – Analysis of Vinegar by Titration                                  |
| 15          | 12/05/23    | Check-out                                                               |
| 16          | 12/19/23    | FINAL EXAM                                                              |

**Chemistry and Biochemistry Department, Queens College - CUNY**

**CHEM 1011- Basic Chemistry Lab (Fall 2023)**

**Mondays 1:40 pm, Section Number: 101.1/2 [25718]**

**Instructor's Full Name:** Angela Fried

**Instructor's Email:** [afried@gradcenter.cuny.edu](mailto:afried@gradcenter.cuny.edu)

**Instructor's Office Hour:** By appointment only

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

**Other required items:** 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 1013

**Coordinator:** Prof. Iva Burdett ([iva.burdett@qc.cuny.edu](mailto:iva.burdett@qc.cuny.edu))

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

**Syllabus**

**I. Laboratory Course Format: in-person**

- A. ALL In-person lab sessions will be held on Queens College campus in Remsen 151 at your scheduled time and day.
- B. Attendance is mandatory. A missed lab will receive no credit. Students must report to lab on time. There is NO make-up for any missed laboratory experiment.
- C. A lab can only be excused with documentation relating to an unplanned emergency (medical or legal) or religious observance. If you cannot attend the lab due to the COVID quarantine requirement, a COVID test record must be provided afterwards.
- D. Attendance will be taken at 1:40pm. Due to safety concerns, any student that arrive after 2:00pm will not be allowed to perform the experiment.

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**This course satisfies the following two Queens College General Education learning outcomes:**

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LPS 4: Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.

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A custom laboratory manual is used and is available free of charge, posted on the Blackboard in the Content Section.

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Each lab is graded for 100 points distributed as follows - 10% Prelab Questions; 60% Lab Report; 10% Post-lab Assignments, and 20% Experimental Final Exam. **All laboratory experiments are to be performed individually (and evaluated by the instructor). There are no team experiments. Each person registered for lab is to perform each laboratory experiment individually.**

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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.

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When applicable: "Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live."

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message with their phone number and CUNY ID. They may also e-mail: [counselingservices@qc.cuny.edu](mailto:counselingservices@qc.cuny.edu)

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### **Schedule of Experiments**

| <b>Week</b> | <b>Date</b> | <b>Experiment</b>                                                                              |
|-------------|-------------|------------------------------------------------------------------------------------------------|
| 1           | 08/28/23    | Check-in, Safety Video, #1 – The Bunsen Burner                                                 |
| 2           | 09/04/23    | <b>NO LAB, LABOR DAY</b>                                                                       |
| 3           | 09/11/23    | #2 – Laboratory Measurements                                                                   |
| 4           | 09/18/23    | #3 – Conversion Factors                                                                        |
| 5           | 09/25/23    | <b>NO LAB, No Classes Scheduled</b>                                                            |
| 6           | 10/02/23    | #4 – Density                                                                                   |
| 7           | 10/09/23    | <b>NO LAB, College Closed</b>                                                                  |
| 6           | 10/10/23    | <b>Tuesday changed to a Monday schedule</b> #5 – Determination of the formula of a Metal Oxide |
| 7           | 10/16/23    | #6 – Water of Hydration                                                                        |
| 8           | 10/23/23    | #7 – Chemical Reactions Part 1: Combination and Decomposition Reactions                        |
| 9           | 10/30/23    | #8 – Chemical Reactions Part 2: Single and Double Replacement Reactions                        |
| 10          | 11/06/23    | #9 – Calorimetry                                                                               |
| 11          | 11/13/23    | #10 – Kinetics                                                                                 |
| 12          | 11/20/23    | #11 – Equilibrium                                                                              |
| 13          | 11/27/23    | #12 – Charles's Law                                                                            |
| 14          | 12/04/23    | #13 – Analysis of Vinegar by Titration                                                         |
| 15          | 12/11/23    | Check-out                                                                                      |
| 16          | 12/18/23    | FINAL EXAM                                                                                     |