CHM 240 Quantitative Chemistry (Sec 19370-19372-19419) Syllabus

INTRODUCTION TO COURSE AND INSTRUCTOR

Semester Spring 2023	***Program/Department*** Chemistry
Course Name Quantitative Chemistry	***Instructor Name*** Shuiqin Zhou
Credits and Hours 4 *credits* *4 class hours + 4 lab hours.*	***Office Location*** 6S-240
Mode of Instruction	In person
Time Mon & Wed 10:10AM-12:05PM	***E-Mail*** shuiqin.zhou@csi.cuny.edu
Location 1S-219	***Telephone*** 718-982-3897 (Office)
Website CUNY Blackboard	***Faculty Office Hours*** Mon & Wed 2:30-3:30 pm or email to schedule appointments
If there are questions or concerns that you have about this course that you and I are not able to resolve, please feel free to contact the Chair of the department to discuss the matter.	
CHAIR/PROGRAM DIRECTOR'S NAME	Qiao-Sheng Hu
DEPARTMENT NAME	Chemistry
CHAIR/PROGRAM DIRECTOR'S EMAIL	QiaoSheng.Hu@csi.cuny.edu
DEPARTMENT/PROGRAM PHONE NUMBER	*718-982-3891*

COURSE DESCRIPTION AND PRE/COREQUISITES

A study of the quantitative aspects of chemical changes, chemical equilibria, the stoichiometry and energetics of chemical reactions. Theory and laboratory in volumetric, opticometric, electrostatic, and kinetic methods of chemical analysis. An introduction to instrumental methods of analysis. Students taking the lecture **must** take the lab.

Pre-requisites: CHM 142 and CHM 127

REQUIRED COURSE MATERIALS

Textbook: Fundamentals of Analytical Chemistry 9th Edition, Skoog/West/Holler/Crouch

For each class, please bring a scientific calculator

The Library Resources that the chemistry students may find useful

URL: https://library.csi.cuny.edu/chem

COURSE GOALS

1. Students will learn and understand the underlying chemical principles and a wide range of methods that are important to the quantitative analysis of chemicals.
2. Students will learn how to judge the accuracy and precision of experimental data and to show how these judgments may be sharpened by the application of statistical methods.

3. Students will learn how to select a suitable quantitative method for a specific chemical analysis.
4. Students will learn how to work safely in a chemical laboratory and acquire laboratory skills to obtain high-quality analytical data.
5. Students will learn the applications of computers in data acquisition, processing, and analysis, particularly with the aid of the spreadsheet tools that are commonly available.

STUDENT LEARNING OUTCOMES

A student will:

- Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve problems in chemical analysis.
- Identify and apply the fundamental concepts and methods of chemical analysis.
- Apply the scientific methods to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, and data analysis.
- Use the tools of analytical chemistry to carry out collaborative laboratory investigations.
- Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.
- Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.

COURSE REQUIREMENTS/ASSIGNMENTS

Quizzes and Exams: There will be **4 in-class** quizzes (about 30-40 minutes each) and **3** midterm exams (whole period of the regular class hour), and a final exam through the semester. Midterm exams will cover the new material after the previous exam. Final exam will cover the entire semester's work. The lowest quiz grade and the lowest mid-term exam grade will be dropped. **All quizzes and midterm exams will be offered in person. The tentative dates for quizzes and exams are listed on Course Schedule. The exact dates for each quiz and exam will be announced on blackboard and in classroom.**

Expectations and Homework: You will find class lectures most helpful and useful if you read the chapter and attempt the homework before coming to class. Asking questions during class is highly encouraged! Homework will be assigned at the end of each chapter and posted on Blackboard. It is highly recommended that you finish the corresponding assignment after each lecture. You are responsible for checking the answers with the solutions guide posted on Blackboard. **Doing the homework is critical to be successful in this course! Expect to spend 10-15 hours per week, every week, on homework.**

GRADING POLICY AND EVALUATION

Laboratory*	25 %		**Letter Grade Assignment**
Quizzes	25 %		A ≥ 93, A- ≥ 90;
Midterm Exams	25%		B+ ≥87, B ≥83, B- ≥79;
Final Exam	25%		C+ ≥ 75, C ≥ 67;
			D ≥ 60; F < 60
Up to 3% bonus grade for class participation and for completion of extra exercises			

*** The Lab classes and grade are fully controlled by your lab instructor**

TENTATIVE COURSE CALENDAR/SCHEDULE

Week	Topics	Reading
1–01/25	Introduction & Calculations in Anal. Chem.	Ch. 1; Ch. 4
2 – 01/30; 02/01	Errors in Chemical Analysis; Significance data/Statistical analysis	Ch. 5; Ch. 6; Ch. 6-7
3– 02/06 (**Quiz1**) 02/08	Statistical analysis-continued; Calibration Aqueous solution; Chemical Equilibrium	Ch.7-8 Ch 9
4 –02/15	Equilibrium; Buffer; Electrolytes effects	Ch 9-10
5– 02/21 02/22 **(Exam 1)***	Titration in analytical chemistry **Mid-term Exam 1**	Ch. 13
6 – 02/27 03/01	Titration; Titration of acids/bases Complex acids/bases titration	Ch. 13-14 Ch 14-15
7 –03/06 03/08 **(Quiz 2)**	Complex acids/bases titration-continued Applications of neutralization titrations	Ch. 15-16
8 – 03/13; 03/15	Precipitation reactions/Titrations Complexation reactions/EDTA Titrations	Ch. 17
9 – 03/20; 03/22 **(Exam 2)***	Electrochemistry **Mid-term Exam 2**	Ch. 18
10 –03/27; 03/29	Electrochemistry	Ch. 19-20
11 –04/03 **(Quiz 3)**;	Spectroscopic methods	Ch. 24
12–04/17; 04/19	Spectroscopic methods	Ch. 24; Ch26
13 –04/24; 04/26 (**Exam 3)***	Spectroscopic methods **Mid-term Exam 3**	Ch. 26; Ch. 27
14 – 05/01; 05/03	Kinetics; Intro to analytical separations	Ch 30-31
15 –05/08; 05/10	Intro to analytical separations Gas chromatography (partial)	Ch 31-32
16-05/15 (**Quiz 4**)	Final Review	
17 –Final week	Final Examination	Comprehensive

SUBJECT TO CHANGE STATEMENT

This syllabus and course calendar/schedule are subject to change in the event of extenuating circumstances.

CUNY POLICY ON ACADEMIC INTEGRITY

Academic dishonesty is prohibited in The City University of New York. Penalties for academic dishonesty include academic sanctions, such as failing or otherwise reduced grades, and/or disciplinary sanctions, including suspension or expulsion. This policy also defines example of academic dishonesty: cheating, plagiarism, obtaining unfair advantage, and falsification of records and official documents. Please visit the following website to read the full policy: https://www.csi.cuny.edu/sites/default/files/pdf/privacy/cuny_academic_integrity.pdf
Students must work independently on all graded quizzes and exams. All quizzes and exams are timed. If you finish early, you can submit early. You should not consult with any other person nor use the internet to search answers. Only scientific calculator is allowed to use for quizzes and exams. Cell phones or other electronic device should not be used during quizzes and exams, and they should be turned off all times.

Specific examples of academic dishonesty in this course include, but are not limited to:
• Having someone take a quiz or exam for you
• Communicating with someone else during a quiz or exam
• Receiving information from any person during a quiz or exam
• Searching for quiz or test answers on the internet ("googling" the answers)
• Sharing information about quiz and exam questions with other students who have not taken
• Providing a false excuse for missed quizzes or exams

REASONABLE ACCOMODATIONS AND ACADEMIC ADJUSTMENTS

The City University of New York, in compliance with Section 504 of the Federal Rehabilitation Act of 1973 ("Rehabilitation Act"), the Americans with Disabilities Act of 1990 ("ADA"), New York State Executive Law §296, and New York City Human Rights Law, provides qualified individuals with disabilities the opportunity to participate in programs, activities, or employment. For more information and access to the full policy please visit: https://www.csi.cuny.edu/about-csi/diversity-csi/office-diversity-compliance/reasonable-accommodations-and-academic-adjustments

STUDENTS WITH DISABILITIES

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe that you have a disability requiring an accommodation, please contact the Center for Student Accessibility at 718.982.2510/ CSA@csi.cuny.edu. For more information please visit: www.csi.cuny.edu/csa/.

TUTORING AND ACADEMIC ASSISTANCE

The College offers tutoring to students, free of charge. For a complete list of the Tutoring Centers please visit https://www.csi.cuny.edu/students/academic-assistance/tutoring

COURSE POLICIES

Attendance and withdrawal: A student who is absent without eligible reasons more than 4 times in the semester is assigned a grade of WU (withdraw unofficially). **If you are absent from class, it is your responsibility to check on announcements made while you were away. *No makeup quizzes and exams will be given. A missed exam or quiz will be counted as a zero score.*** One makeup per semester per student may be given to students who missed an exam or a quiz due to personal/family emergency or other serious encumbrances with appropriate documentation justifying that you were unable to present on the specific test date and notified the instructor via email prior to missing an exam or a quiz.

According to CSI's Spring 2023 Academic Calendar, the last day to withdraw with the grade of "W" is May 16, 2023.

CAMPUS (CIX) EMAIL: Students are expected to check campus (cix) email regularly. Students must recognize that certain communications, may be time-sensitive, and they may be required to monitor email on a more frequent basis than determined by instructional needs. If students have issues accessing their campus (cix) email please email the helpdesk@csi.cuny.edu or visit the Virtual Computer Lab.