Macaulay Honors General Chemistry II (Department of Chemistry, CHM 142, Section 19421, Spring 2023)

Description and pre/corequisites

A continuation of CHM 141. The course will cover intermolecular forces, solutions, the solid state, chemical kinetics and equilibria (including acid-base reactions), the entropy and free energy, electrochemistry and, if time permits, nuclear chemistry and organic chemistry. At the end of the course, students should have a representative understanding of the basic concepts of general chemistry. Prerequisite: CHM 141. Corequisite: CHM127. 3 credits/4 hours.

Learning objectives

The student will comprehend how chemistry is important and relevant in daily life. The student will demonstrate an understanding of how intermolecular forces influence the different states of matter, including solutions properties. The student will learn the parameters controlling chemical reactivity, including the equilibrium concept, and electrochemistry. The student will learn and apply the thermodynamic principles of entropy and kinetics. The student will demonstrate analytical and problem solving skills.

General education learning objectives

- Gather, interpret, and assess information from a variety of sources and points of view.
- Evaluate evidence and arguments critically and analytically.
- Produce well-reasoned written or oral arguments using evidence to support conclusions.
- Identify and apply the fundamental concepts and methods of chemistry.
- Demonstrate how tools of chemistry can be used to analyze problems and develop solutions.
- Articulate and evaluate the empirical evidence supporting a scientific theory.

Instructor

Dr. Michal Kruk, Email: Michal.Kruk@csi.cuny.edu (with typical response to e-mails within 24 hours on Mo-Fr), Phone: 718-982-4030; Room 6S-241; Office hours: We, Fr 1:00 – 2:00 PM (in-person in Room 6S-241 or, upon request, online through Blackboard Collaborate Ultra)

Department contact information

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. Dr. Qiao-Sheng Hu. Department of Chemistry. E-mail: QiaoSheng.Hu@csi.cuny.edu. Tel.: 718-982-3901; 718-982-5872.

Text Book

Chemistry and chemical reactivity, 10th Edition by Kotz, Treichel, Townsend and Treichel with OWLv2 access for at least 6 months (options include ISBN 9780357001172 or ISBN 9780357001158 loose-leaf + ebook + OWLv2 24 month access)

Course Hours

We, Fr 2:30 – 4:25 PM In-person (Room 3S-112)

Grading

Grade components: Three exams 45 %; Final exam 35 %; Quizzes 10 %; Homework 10 %.

Homework: For each chapter, there will be a homework assignment in OWLv2 (online homework system). The homework is due the next Friday after the week in which the chapter has been covered in class. The assignments are available online until the date due.

Quizzes and Exams: There will be three exams during the semester and the final exam. A basic scientific calculator will be needed for the exams, the use of advanced calculators may be prohibited, and the use of cell phones with calculator functions is not acceptable. There will also be short quizzes after each chapter (unless there is an exam after the particular chapter). Make-up quizzes and exams will not be given, unless an exception is arranged with the instructor. The lowest quiz score will be dropped (if all six quizzes are taken).

Grading scale: A (90% or higher), A- (87-90%), B+ (83-87%), B (80-83%), B-(77-80%), C+ (73-77%), C (70-73%), D (60-70%), F (below 60%)

General

Course structure: This is an in-person lecture course, meaning that we will meet in class for lectures, quizzes and exams. The slides with the lecture presentation content will be available on Blackboard. If there is a snow day or any other unexpected occurrence that will not allow us to meet in class for the lecture, an online lecture may be given through Blackboard Collaborate Ultra.

Grade components. Most of the credit towards the grade in this course is earned through exams (in-person). The participation in the lecture, reading the textbook, and reviewing the lecture slides are important components of the exam preparation. Quizzes also contribute towards the grade, but they carry much less weight and primarily serve the purpose of informing you (and me) about your level of mastery of the material as the course progresses. The homework (online via OWLv2 that accompanies the textbook) provides you with additional opportunity to practice the material and to earn some credit (scores available upon completion of assignments).

Campus (CIX) Email

Students are expected to check their 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.

Last day to drop the course

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

Course outline

Chapter 11. Intermolecular forces and liquids

Lectures on Jan 25, 27, Feb 1
Homework in OWLv2 due Feb. 10
Quiz on Feb. 3

Chapter 12. The solid state

Lectures on Feb 3, 8, 10
Homework in OWLv2 due Feb. 17
Quiz on Feb. 15

Chapter 13. Solutions and their behavior

Lectures on Feb 10, 15, 17
Homework in OWLv2 due Feb. 24

Midterm exam 1. Chapters 11-13 (Feb 22)

Chapter 14. Chemical kinetics: the rates of chemical reactions

Lectures on Feb 22, 24, Mar 1, 3
Homework in OWLv2 due Mar. 10
Quiz on Mar. 8

Chapter 15. Principles of chemical reactivity: equilibria

Lectures on Mar 3, 8, 10, 15
Homework in OWLv2 due Mar. 24
Quiz on Mar. 17

Chapter 16. Principles of chemical reactivity: the chemistry of acids and bases

Lectures on Mar 15, 17, 22
Homework in OWLv2 due Mar. 31

Midterm exam 2. Chapters 14-16 (March 24)

Chapter 17. Principles of chemical reactivity: other aspects of aqueous equilibria

Lectures on March 24, 29, 31, April 14
Homework in OWLv2 due Apr. 19
Quiz on Apr. 19

Chapter 18. Principles of chemical reactivity: entropy and free energy

Lectures on Apr 19, 21, 26
Homework in OWLv2 due May 5
Quiz on Apr. 28

Chapter 19. Principles of chemical reactivity: electron transfer reactions

Lectures on Apr 28, May 3
Homework in OWLv2 due May 12

Midterm exam 3. Chapters 17-19 (May 5)

Chapter 25. Nuclear chemistry; Chapter 23. Carbon: not just another element (if time permits) (May 5, 10)

Comprehensive final exam (May 18; room TBA)

Note: Not every chapter will be covered entirely. Indicated dates are tentative.

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. The read the full policy, please visit the following website: https://www.csi.cuny.edu/sites/default/files/pdf/privacy/cuny_academic_integrity.pdf

Reasonable Accommodations 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