CHEM 2200: GENERAL CHEMISTRY II LECTURE – DAYTIME – FALL 23

LECTURE INSTRUCTOR CONTACT INFORMATION, CLASS AND OFFICE HOURS

Professor Maggie Ciszkowska
malgcisz@brooklyn.cuny.edu

Class Meetings: Tuesday and Thursday, 11:00 AM - 12:15 PM, room **Ingersoll Add 148 (148 IA)**
IMPORTANT: Please check this room number on CUNYFirst before your first class.

Office Hours: Thursday, 1:00 PM - 2:30 PM room **359 IA** or by appointment *(make your appointment by e-mail), any changes in office hours will be posted on Blackboard in Announcements*

LECTURE MATERIALS are available on BLACKBOARD:
CHEM 2200 FALL 2023 Lecture Sections TEBL TECL TEDL TEEL TEGL
See below and p.2 for ***recitation*** *information*

REQUIRED TEXTS:

- ***Chemistry 2e*, P. Flowers, OpenStax, 2019**

This text is available as a free PDF at https://openstax.org/details/books/chemistry (you can print chapters)
It is also available free for Kindle at http://www.amazon.com
You can order a hard copy through https://brooklyn.textbookx.com/adm/ or from http://www.amazon.com

REQUIRED ITEM: Scientific calculator

PRE-/CO-REQUISITE REQUIREMENT: You must be registered for Chem 2201 laboratory if you have not already completed it. You will not be permitted to take additional Chemistry courses if you do not complete the laboratory. **ALSO**: You must complete Chem 2110 before you can register for Chem 3511/12 Organic Chemistry I. You should register for Chem 2110 simultaneously with Chem 2200 if you intend to do go on.

Learning Objectives for Chemistry 2200

Upon completion of this course, students should:

- Understand the basic physical principles underlying chemistry and be able to apply them both to qualitatively explaining phenomena and quantitatively predicting or interpreting outcomes.
- Understand and be able to explain fundamental ideas in the practice of science, including the nature of scientific evidence and the scientific method.
- Students should be able to apply principles of chemistry to understanding its role in other fields (e.g. biology), while understanding its underpinnings in physics and mathematics.

RECITATION SECTION (see page 2 of this syllabus)

This course includes a required **recitation** section; **attendance** in recitation is **mandatory.** Quizzes in your recitation section are part of your course grade. You will receive a separate syllabus for your recitation section.

CHEMISTRY DEPARTMENT COUNSELING

Department Chair	**Prof. Brian Gibney**	bgibney@brooklyn.cuny.edu
Chair's Student Office Hours: Thursday 3:30 – 4:30 PM (except Oct 12 & Nov 2), 359 IA		
Undergraduate Deputy Chair	**Prof. Maggie Ciszkowska**	malgcisz@brooklyn.cuny.edu
Undergraduate Advisor	**Prof. Andrzej Jarzecki**	jarzecki@brooklyn.cuny.edu

OTHER COUNSELING

Health Profession Counseling	**Benjamin N. Stewart**	benjamin.stewart@brooklyn.cuny.edu

LECTURE EXAMS (Tuesdays, 11:00 AM – 12:15 PM, room 148 IA (lecture room):

FIRST EXAM: **October 3** covers: Ch. 12, Ch. 13, in Ch. 14 sections 14.1-14.5

SECOND EXAM: **November 21** covers: in Ch. 14 sections 14.6, 14.7, Ch. 15, Ch. 16, Ch. 17

FINAL EXAM: **December 19 (Tuesday),** 10:30 PM – 12:30 PM covers: **ALL CHAPTERS**

If students miss a midterm, an average of the other midterm and the final exam will replace the missing midterm grade. If students miss the final exam, they will receive a grade of INC for the course and will have the opportunity to make up the final exam after the start of the following academic year semester (Fall or Spring).

GRADING:

Your final grade will be a weighted average calculated as follows:

40% Two lecture exams
25% Recitation quizzes
35% Final Exam

Final grades are not curved, but are set according to the following scale:

95 or higher: **A+**	65-67.9: **C+**
83-94.9: **A**	58-64.9: **C**
80-82.9: **A–**	55-57.9: **C–**
77-79.9: **B+**	50-54.9: **D***
72-76.9: **B**	Less than 50: **F**
68-71.9: **B–**	

***Note:** If you earn a grade of D, that is the grade you will receive. Requests to change it to an F will not be honored.

EXTRA CREDIT: There are **Practice Tests** posted for each chapter; they are available on **Blackboard** in **Assignments** (see p. 7 for details). *Students who complete **each practice test by a given deadline** with a grade of at **least 60%** will be awarded an **extra credit**.*

Chemistry 2200 RECITATIONS

Your RECITATION INSTRUCTOR will provide all details regarding your RECITATION class.

Recitation Instructors: *contact your recitation instructor if you have any questions re your recitation class*

TE**B**L(lecture) M. Ciszkowska (Tue & Thu 11:00 AM - 12:15 PM)
TE**B**R (rec) Britney Singh Britney.Singh@brooklyn.cuny.edu
(TEBR recitation Wed 1:15PM - 2:05PM)

TE**C**L(lecture) M. Ciszkowska (Tue & Thu 11:00 AM - 12:15 PM)
TE**C**R (rec) **Najmunisa Abbasi** NAbbasi@brooklyn.cuny.edu
(TECR recitation Thu 1:15PM - 2:05PM)

TE**D**L(lecture) M. Ciszkowska (Tue & Thu 11:00 AM - 12:15 PM)
TE**D**R (rec) **Najmunisa Abbasi** NAbbasi@brooklyn.cuny.edu
(TEDR recitation Fri 8:00 AM - 8:50 AM)

TE**E**L(lecture) M. Ciszkowska (Tue & Thu 11:00 AM - 12:15 PM)
TE**E**R (rec) **Andrzej Jarzecki** Jarzecki@brooklyn.cuny.edu
(TEER recitation Thu 1:15PM - 2:05PM)

TE**G**L(lecture) M. Ciszkowska (Tue & Thu 11:00 AM - 12:15 PM)
TE**G**R (rec) **Lloyd Lapoot** Lloyd.Lapoot@brooklyn.cuny.edu
(TEGR recitation Mon 12:15PM - 1:05PM)

***IMPORTANT**: You have to **memorize** the **name** of your **recitation instructor** AND the **code of your recitation** section (e.g., TEBR, TECR, TEDR…). You will need this info during our lecture exams.*

IMPORTANT DATES:

August 31	Last day to add a course
September 4	College Closed
September 14	Last day to withdraw without a "W" grade
September 15-17	No Classes
September 25	No Classes
October 9	College Closed
October 10	CONVERSION DAY: Classes follow a Monday schedule
November 22	No Classes
November 23-24	College Closed
November 25-26	No Classes
December 11	Last day of classes, last day to withdraw from a course with a grade of "W"
December 12	Reading Day

Academic dishonesty is prohibited in the City University of New York.
The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at http://www.brooklyn.edu/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation. Students should be aware that faculty may use plagiarism detection software. Students caught cheating may be given a range of possible academic sanctions up to and including the assignment of a failing grade for the course. This is in addition to any possible disciplinary sanction assigned by the college administration.

Student Disability Services
The Center for Student Disability Services (CSDS) is committed to ensuring students with disabilities enjoy an equal opportunity to participate at Brooklyn College. In order to receive disability-related academic accommodations, students must first be registered with CSDS. Students who have a documented disability or suspect they may have a disability are invited to schedule an interview by calling (718) 951-5538 or emailing Josephine.Patterson@brooklyn.cuny.edu If you have already registered with CSDS, email Josephine.Patterson@brooklyn.cuny.edu or testingcsds@brooklyn.cuny.edu to ensure accommodation emails are sent to your professor.

Student Bereavement Policy
Students who experience the death of a loved one during the semester should consult the student bereavement policy here: https://www.brooklyn.edu/policies/bereavement/

Non-Attendance Due to Religious Beliefs
Students who are unable to attend class due to religious observations should consult the Brooklyn College Undergraduate Bulletin for the college's policy, and contact the lecturer to discuss the issue. Students must come forward with the issue in a timely manner.

Pass-Fail Option:
Details regarding taking courses on a pass/fail basis are given in the Brooklyn College bulletin. Students interested in this option should read the bulletin carefully, as they may not be eligible to do so; questions should be directed to the Registrar. Also note that the deadline to declare an intention to take a course Pass-Fail varies from semester to semester, but generally falls within the first two weeks of the course (contact the Registrar for the specific date). After this deadline, it is impossible to take the course Pass-Fail.

Useful Contact Information:

Chemistry Department:
http://www.brooklyn.cuny.edu/web/academics/schools/naturalsciences/undergraduate/chemistry.php
Pre-Health Professions Website:
https://www.brooklyn.cuny.edu/web/academics/special-programs/prehealth.php
Brooklyn College Learning Center (free tutoring available)
http://www.brooklyn.cuny.edu/web/academics/centers/learning.php

As an educator, I support the rights of undocumented students to an education. If you have any concerns in that regard, feel free to discuss them with me, and I will respect your wishes concerning confidentiality.
For resources and support, please visit Brooklyn College's Immigrant Student Support Office located at 17 Roosevelt Hall. You can also contact them via email at ISSO@brooklyn.cuny.edu or via phone at 718-951-5023.

CHEM 2200 ASSIGNED READING AND HOMEWORK PROBLEMS

Below is the assigned reading and a corresponding set of homework problems. Read the material at least once before the lecture, and spend some time on the in-chapter problems to reinforce it. Unless noted otherwise, problems listed as Homework correspond to the end-of-chapter problems for the corresponding chapter. Answers to odd-numbered problems are at the end of the text. If you are instructed to memorize something, the test will be written assuming you have done so.

Homework is assigned but not graded. Examination questions will mostly be similar to those given in the text. You should do as many of these as possible before recitation section, and bring any questions you have on the work to your instructor. Remember: Your recitation time is your chance to get help with things you do not understand. If you have not done the homework, you will get little out of it.

UNIT	Assigned Reading and Problems
Kinetics	**Chapter 12**: Problems 1, 3, 4, 5, 6, 7, 12, 13, 15, 17, 19, 21, 23, 25, 26, 29, 31, 37, 44, 46, 47, 53, 68, 69, 70, 71, 73, 74, 76, 79, 81, 83, 84 **Note:** In Section 12.4, you are not required to be able to work problems using the 0^{th} order or 2^{nd} order integrated rate laws. You are also not required to determine the order of a reaction rate by graphing, as described in Example 12.7. However, you do need to be able to use the 1^{st} order integrated rate law in ways similar to that shown in Example 12.6. You should also know what the half-life of a reaction is, and how it is related to the rate constant in a first-order reaction (see the subsection of 12.4 "The Half-Life of a Reaction."
Fundamental Equilibrium Concepts	**Chapter 13**: Problems 1, 3, 5, 6, 7, 9, 11, 13, 15, 17, 19, 25, 29, 31, 33, 35, 37, 39, 40, 41, 45, 46, 49, 53, 55, 57, 59, 61, 65, 67, 69, 75, 77, 79, 81, 83, 89
Acid-Base Equilibria	**Chapter 14**: Problems 1, 3, 5, 9, 11, 15, 17, 19, 21, 25, 27, 29, 31, 35, 47, 51, 53, 57, 58, 61, 69, 77, 79, 81, 86, 87, 89, 91, 94, 95 **Memorize**: Table 4.2, identities of some common strong acids (not a misprint, see the table in Chapter 4).
Equilibria of Other Reaction Classes	**Chapter 15**, **Sections 15.1–15.2 (NO section 15.3)**: Problems 1, 3, 9, 11, 13, 15, 25, 29, 31, 33, 37, 49, 55, 61, 63, 65, 67, 69, 75, 77
Thermodynamics	**Chapter 16**: Problems 1, 2, 3, 13, 15, 17, 19, 20, 21, 25, 27, 30, 31, 33, 35, 37, 39, 41, 45, 55, 61, 63, 65, 66
Oxidation-Reduction Rxns Electrochemistry	**Chapter 4, Section 4.2**: Oxidation/Reduction Reactions (Balancing by half-reaction method): Problems 17, 37, 39, 41 **Chapter 17**, **Sections 17.1–17.4 ONLY**: Problems 3, 5, 6, 7, 19, 21, 23, 25, 29, 31, 33
Transition Metals and Coordination Chemistry	**Chapter 19**: Problems 1, 2, 26, 27, 28, 29, 31, 33, 35, 37, 41, 45, 47 Supplement: Chirality in Inorganic Chemistry – Read section and do the exercise at the end of the packet (answers in packet).
Advanced Theories of Covalent Bonding	**Chapter 8, Sections 8.1–8.3 ONLY**: Problems 1, 3, 7, 9, 10, 11, 12, 14, 15, 17, 23, 27, 29, 30
Organic Chemistry	**Chapter 20, Section 20.1, Functional Groups (Follow Lecture Notes)** : Problems 1, 5, 6, 7, 9(a-c, e), 11c, 12(c,d), 15, 17, 22(a,c), 43, 44 Supplement: Chirality in Organic Chemistry
Biochemistry	**Biochemistry** lecture notes
Nuclear Chemistry	**Chapter 21**: Problems 1, 3, 13, 15, 17, 21, 32, 33, 35, 41, 45, 49, 51, 53, 57

This document describes plans for the **course LECTURE only**.

CLASS SCHEDULE

***TEXTBOOK: Chemistry 2e*, P. Flowers, OpenStax, 2019** *https://openstax.org/details/books/chemistry*
IMPORTANT: There might be some changes/modifications to this schedule – they will be announced.

UNIT	**Date**
Introduction to Chem 2200 Kinetics **Chapter 12**	**August 29, August 31, September 5,**
Fundamental Equilibrium Concepts **Chapter 13**	**September 7, September 12, September 14,**
Acid-Base Equilibria Part 1 **Chapter 14.1-14.5**	**September 19, September 21, September 26**, **September 28**
EXAM 1: Chapters 12, 13, 14.1-14.5	**OCTOBER 3**
Acid-Base Equilibria Part 2 **Chapter 14.6, 14.7**	**October 5,** *no class October 10 (Mon classes)*, **October 12, October 17**
Equilibria of Other Reaction Classes **Chapter 15**	**October 19, October 24**
Thermodynamics **Chapter 16**	**October 26, October 31**
Oxidation-Reduction Rxns Electrochemistry **Chapter 4 (Sec 4.2) and Chapter 17**	**November 2, November 7**
Transition Metals and Coordination Chemistry **Chapter 19**	**November 9, November 14**
Advanced Theories of Covalent Bonding **Chapter 8**	**November 16**
EXAM 2: Chapters 15, 16, 17, 19	**NOVEMBER 21**
Advanced Theories of Covalent Bonding **Chapter 8 *cont.***	(*no classes Nov 23*), **November 28**
Organic Chemistry **Chapter 20** Biochemistry	**December 30, December 5**
Nuclear Chemistry **Chapter 21**	**December 7**
REVIEW	**December 12 (Reading Day)**
FINAL EXAM	**December 19 (Tuesday),** 10:30 PM – 12:30 PM

MATERIALS AVAILABLE ON BLACKBOARD

PRACTICE TESTS

There are **Practice Tests** posted for each chapter; they are available on **Blackboard** in **Assignments**.
You can take each test multiple times – your highest grade will be recorded in your gradebook.

*Students who complete **each practice test by a given deadline** with a grade of at **least 60%** will be awarded an **extra credit**.*

LECTURE NOTES (PDF FILES)

There are **Lecture Notes** posted for each chapter; they are available on **Blackboard** in **Course Documents/Lecture Notes**.

COURSE OBJECTVES CHEM 2200

There are **Course Objectives** posted for each chapter; they are available on **Blackboard** in **Course Documents/Course Objectives**.

EXAM ANSWER KEYS

Lecture Exams answer keys will be posted after each lecture exam.

ANSWERS TO HOMEWORK PROBLEMS

There are **Answers to Homework Problems** posted for each chapter; they are available on **Blackboard** in **Course Documents/Answers to Homework Problems**.

PRACTICE TESTS ANSWERS

There are **Answers to Practice Tests** posted for each chapter; are available on **Blackboard** in **Course Documents/Practice Tests Answers**.

ADDITIONAL MATERIALS

There will be **Additional Materials** posted for some chapters; they are available on **Blackboard** in **Course Documents/Additional Materials**. These will include recorded explanations ("mini lectures") of particularly challenging parts of Chem 2200 material as well as other useful items.

TECHNICAL HELP

General Technical Support at Brooklyn College
In general, requests for technical support should be directed to Brooklyn College Information Technology Services (ITS) Help Desk:
Phone: 718.951.4357
E-mail: helpdesk@brooklyn.cuny.edu

Blackboard for Students: Support Site at Brooklyn College
https://libguides.brooklyn.cuny.edu/Blackboard_for_Students
NEED HELP WITH BLACKBOARD?
Students should review Blackboard FAQs below or contact Brooklyn College Students Support
Phone: (718) 951-4357 press 4 / E-mail: StudentBlackboard@brooklyn.cuny.edu

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Chemistry Careers In and Out of the Laboratory

A degree in chemistry opens doors to dozens of exciting and rewarding careers. Here are just a few possibilities.

- Get involved in product development, manufacturing, or quality control for companies producing anything from chemicals to pharmaceuticals to textiles.
- Go on to obtain a MS or PhD in chemistry, biochemistry, biotechnology, bioinformatics, pharmacology, or any other biomedical field, and take a leading role in medical research. Design and test new drugs and medical devices.
- Get involved in sales and marketing for chemical and pharmaceutical firms. Companies are always looking for people with a strong technical background to market their products, and will pay top dollar for them.
- Go into the field as an environmental chemist to study and protect the natural world.
- Use your skills in interesting and challenging ways, from evaluating risk for insurance firms to restoring artwork for museums.
- Work in law enforcement, in anything from forensic investigation to health and safety regulation. Or work inside the political process at a government agency to help formulate policy on scientific, medical and environmental issues.
- Pursue a career in patent law and help bring the next great scientific breakthrough to the market. Or work in the U.S. Patent and Trademark Office to ensure that inventors' rights are protected.

Salary Information

Chemistry Degree	Median Base Salary. NY region*
BA or BS	$85,000
MS	$97,867
PhD	$110,000

* From A. Widner, "What US chemists made in 2021, according to the ACS salary survey," *Chemical and Engineering News*, October 31, 2021

Salaries for chemists are high, but do not do justice to the excitement of the field. Science as it is practiced today is collaborative, and chemists have abundant opportunities to travel, to work with interesting people, and to present the results of their work in ways that have a profound influence on the world. Science will shape the world of the 21st century, and you have the chance to be part of that process.

Medical School, the Chemistry Major, and You

Fiction #1: Being a chemistry major will hurt my chances for medical school, because the hard courses may lead to a lower GPA.

Fact: Students majoring in mathematics and the physical sciences (this includes Chemistry) have among the highest medical school acceptance rate of any major:

Primary Undergraduate Major	Acceptance Rate
Mathematics and Physical Sciences (including Chemistry)	42.3%
Biology and Health Sciences	36.0%
Humanities and Social Sciences	37.2%
Other	33.5%

Based on data for the entering class of 2021, reported by the American Association of Medical Colleges

Table compiled from data available at https://www.aamc.org/

Fiction #2: Chemists have to take a lot of hard courses so they don't have time to do volunteer work, research, and other activities that help with medical school applications.

Fact: A student who has completed his or her requirements for medical school can obtain a chemistry degree with as few as five additional courses. This leaves plenty of time for other activities.

Fiction #3: If I don't get into medical school, I may be stuck working in a lab all day.

Fact: Chemists have enormous opportunities outside the lab. Chemical and pharmaceutical companies desperately need managers and salespeople with chemical knowledge, and will pay top dollar for them. Chemists also find work in finance, insurance, law, government and manufacturing. Go to the American Chemical Society website on Careers (https://www.acs.org/content/acs/en/careers.html) and use the "College to Career" link.

Some other advantages of being a chemistry major:

- Chemistry majors can receive credit for performing research work with a faculty mentor. This means the time you spend on research gets you closer to graduating and your research experience appears on your transcript.
- Chemistry majors get the skills they need to perform advanced laboratory work, so they can get better research positions, accomplish more and get stronger letters of recommendation from their mentors.
- Thanks to generous donations by alumni, the Department of Chemistry is able to give out more than $5,000 every year in fellowships, scholarships and awards. These are an aid to both the pocketbook and the resumé.