

Chemistry 201 Spring 2023

Lecturer: Dr. Tamara Byk
Email: tbyk@sdsu.edu
Office Hrs: M, W 4-5 pm in MSLC

Lab Coordinator: Laurie Clare
Email: lclare@sdsu.edu
Office Hrs: by appointment in CSL 313

Waitlist students should email the lab coordinator (lclare@sdsu.edu) with your name and Red ID info ASAP to gain access to materials on Canvas. You are 100% responsible for all assignments that are due and for keeping up with the work.

Text: Chapters 3-4, 8 14-19 and 25 of “Chemistry and Chemical Reactivity” (10th Edition) by John C. Kotz; Paul M. Treichel; John R. Townsend; David Treichel. The electronic version is available when you register with OWLv2 Cengage. The link is available in the “Important Information and Links” Module in your Chem 201 Canvas Course. Payment for the ebook is included in the \$22/unit Equitable Access program. There are rental options through Cengage.com. You will see the charges on your student account after the add/drop date if you choose to stay in the program

Other Required Materials: Chem 201 Lab Manual, Lab Notebook, lab coat or flame-resistant yellow lab apron, safety glasses and a non-graphing, scientific calculator.

OWLv2 HW (Required): Cengage OWLv2 will be used extensively for graded homework. A link for Cengage OWLv2 will be available on your Chem 201 Canvas Home page in the “Important Information and Links” module. Additional Study material: older quizzes and exams will be available in Canvas.

For All technical difficulties or errors that arise with the OWLv2 systems please contact the [OWL Technical Support](#) or contact the lab coordinator, lclare@sdsu.edu The instructors and TAs will be unable to help you resolve anything but the most basic (is it plugged in?) technical problems.

There will be three midterm OWL Homework scores posted, each worth 35 point for a total of 105 points. Scores will be uploaded after each of the first two midterms, the last score will be uploaded after the final. If 75% of the work is completed, you will receive the full 35 points. If you complete less than 75%, your score will be calculated based on the 35 points/75% ratio. For example, if you score 69%: $69\% \times 35 \text{ points}/75\% = 32.2 \text{ points}$. Refer to the Spring '23 Schedule for due dates

Modes of Instruction, Lecture and Recitation

Unless otherwise instructed, all lecture and recitation classes are in-person. Lectures are held on Mondays, Wednesdays, and Fridays. **Recitations are held on Mondays and Tuesdays only, attendance is mandatory.** Recitation sessions will consist of TAs reviewing lecture material followed by a 20–25-minute quiz or the TA will give a short review followed by a worksheet. Students may collaborate and ask their TA questions to complete the worksheet.

Mode of Instruction for Lab:

You must attend the lab section for which you are registered. If you attend any other lab section without permission from the lab coordinator, you will receive a zero score for the formal lab write-up.

Labs are two hours and forty minutes, do not arrive late and do not stay past your scheduled time.

For quantitative labs, there will be a pre-lab quiz posted on Canvas; they are worth 5 points per lab. A pre-lab write-up, written in your lab notebook, is required for each quantitative lab. The carbon copy version from the notebook is due at the beginning of lab. As experiments are conducted, data is written into your lab notebook in ink. Data from the experiment is used to write a formal lab report that is due before the start of the next lab meeting. Late labs can be uploaded to Canvas up to one week past the due date. Two points will be deducted for each weekday the lab report is late. **Lab reports will not be accepted one week after due date.**

There will be three separate qualitative labs. Two of the qualitative labs are single session labs with scores solely based on correctly identifying contents of issued sample. The last qualitative lab is conducted over three sessions with a short report based on identifying contents of issued sample due one week after last session. No pre-labs are required for qualitative labs, but observations and results must be recorded in the lab notebook and handed in to be graded.

Absences

Absences from Recitation: If you are going to miss a recitation, contact the lab coordinator, lclare@sdsu.edu, before your sessions begins, **Do Not Contact Your TA.** The coordinator will find another recitation for you to attend, but only if you send an email to the lab coordinator BEFORE your session begins! Placement into another recitation will be done only once. For example, if you know you cannot make the Monday morning 8 am recitation, contact the coordinator before the session starts and you will be rescheduled later that same Monday or Tuesday, the next day. If you are in the Tuesday 5 pm recitation you can be placed one time into an earlier session as there is no later session. No quiz make-ups are allowed.

Quizzes are given only during Monday and Tuesday recitations and are worth 20 points each. There are a total of nine quizzes, the lowest quiz score is dropped.

Worksheets. There are a total of 4 worksheets, they are worth 10 points each. If you miss a recitation that included completing a worksheet, contact the lab coordinator and we will contact your TA so that you can make up a missed worksheet. You can attend your TA's office hour to complete the worksheet, but make-up must occur during the same week the worksheet is issued. Only one make-up is allowed. No Worksheet scores are dropped.

Absence from Lab:

Contact the lab coordinator in the event you are to miss a lab due to an illness, injury, or emergency **before** the lab starts, otherwise, attendance to each lab is mandatory. Documentation of illness, injury or emergency is required. If possible, you will be placed in another lab section. If we cannot place you in another section, the lab coordinator will email pertinent lab data so that you can finish the lab write-up. This will be done one time only.

Medical Related Absence

[Student Health Services](#) (SHS) does not provide medical excuses for short-term absences due to illness or injury. When a medical-related absence persists beyond five days, SHS will work with students to provide appropriate documentation.

When a student is hospitalized or has a serious, ongoing illness or injury, SHS will, at the student's request and with the student's consent, communicate with the student's instructors via the Vice President for Student Affairs and Campus Diversity and may communicate with the student's Assistant Dean and/or the [Student Ability Success Center](#).

COVID-19 Protocols

Vaccination and testing protocols set by the CSU and SDSU will be enforced. Make sure to upload proof of your COVID-19 booster shots through [Healthconnect](#)

Facial Coverings Are Not Required. You may still voluntarily mask either in not-required indoor settings or outdoors if you wish to do so. Any individuals experiencing COVID-19 like symptoms must wear a facial covering if they are on campus to seek testing or as they exit campus to return home if they have onset symptoms while on campus. Either get tested through [Healthconnect](#) or provide test results to [Healthconnect](#). If you are COVID sick and need to quarantine, you will be asked to provide proof through [Healthconnect](#). No make-up work will be accepted without proof from [Healthconnect](#).

If you miss a class or lab due to being quarantined because of a positive COVID-19 result, you must request a class excuse letter. Send an email to vpsafrontdesk@sdsu.edu to notify the university. Student Affairs and Campus Diversity will initiate the process for absent letters to be sent to course instructors, Assistant Deans, and the Provost. Medical documentation may be required prior to the letter being issued.

Grading. Letter grades will be assigned based on your total points (1100 points) using the following scale:

A: 1100-990; A-: 989-957

B+: 956-935; B: 934-880; B-: 879-858

C+: 857-825; C: 824-715; C-: 714-660

D: 659-550

F: <549

Point Distribution

3 midterm exams, multiple choice, 100 pt ea.	300
Final, multiple choice, comprehensive	200
Quizzes (20 pts each), best 8 out of 9	160
4 Worksheets	40
Ion Naming Test, required to pass course	0
Pipet Exercise	5
6 Lab Reports	150
2 Group Unknowns, 20 ea.	40
General Unknown	50
Lab points	20
Pre-lab Quizzes, 5 ea.	30
OWLv2 Homework	<u>105</u>
	1100 pts total

All quizzes, except for the ion quiz, will be given in assigned Recitation rooms. They will be based on lecture material from the previous week. Midterm exams are in-person using a scantron and will consist of 20 multiple choice questions. They will be given on Fridays at the regularly scheduled lecture time in various locations depending on lab section. The Final exam will consist of 40 multiple choice questions based primarily on questions from the 3 midterm exams. There will be a few questions based on material covered in lecture after the third midterm exam.

A make-up exam will be given on the following Monday only for legitimate excuses such as athletic and other school-sponsored events, professional conferences, religious holidays, weddings, illness, or emergency. Work is not a legitimate reason since exams are at regular lecture time and you should arrange your work schedule so that you can attend lecture. **Make sure to contact Professor Clare or Dr. Byk before the beginning of an exam and provide the proper documentation.**

Dropping the course: It is your responsibility to follow university policies regarding Cr/NC, drops, withdrawals, and incompletes. Jan 31 at 11:59 pm is the last day to add, drop, or change grading basis.

Policy on Cheating/Plagiarism:

There is a zero-tolerance policy regarding plagiarism in this course. Any instances of cheating or plagiarism identified by the TA, lab coordinator, or the instructors, will result in a meeting between the instructor and student(s) following which the instance and documentation of plagiarism will be reported to the Academic Senate as well as the student **receiving a grade of F for the course**. It is your responsibility to know what constitutes cheating and plagiarism.

While completing experiments students will work in pairs collecting data. We recognize that this data will be the same in both reports but if any parts of the report are identical, both students will receive zero scores.

Learning Objectives for Chem 201

The main goal of Chem 201 is to complete the general introduction to Chemistry begun in Chem 200 in order to prepare you for more advanced courses in science.

More specific goals are to

- (1) Make sure you are completely comfortable with basic chemical “arithmetic”, that is, calculations involving molecular weight, grams to moles, moles to grams, molarity, dilutions, reaction stoichiometry, and so on.
- (2) Make sure you are completely comfortable with drawing and looking at Lewis structures of chemical compounds. To start to get you thinking of molecules as 3-D objects and not just a collection of letters and numbers in a molecular formula.
- (3) Make sure you know the names, formulas, charges and structures of the common ions and the common strong acids and bases.
- (4) To learn to identify and understand what is happening in three fundamental types of chemical reactions: (i) acid-base reactions, (ii) ion dissolution and precipitation reactions and (iii) oxidation/reduction reactions.
- (5) To learn that there are two aspects to all chemical reactions - thermodynamics and kinetics, that thermodynamics determines the final result or equilibrium state of a chemical reaction, and that kinetics determines how long it will take to reach the equilibrium state.
- (6) More specifically, with regard to thermodynamics, to learn how we characterize the equilibrium state using the equilibrium constant expression and equilibrium constant (K), how you can use knowledge of K along with other information (starting concentrations and stoichiometry) to calculate the final concentrations in a reaction, and how you can experimentally determine

values of K by measuring the final concentrations. You should also learn that ultimately the value of K is determined by the thermodynamic properties (enthalpy, entropy and free energy) of the reactants and products in a chemical reaction and how you can use knowledge of these values to calculate K 's.

(7) With regard to kinetics, you should learn how we characterize the kinetics or speeds of chemical reactions with the rate law and rate constant (k), how we have to determine both of these quantities by experiment, and what types of experiments can be done to do this. You should also learn that the kinetics are determined by the exact path or mechanism that converts reactants to products, and how knowledge of the rate laws is very useful in determining what are likely mechanisms for a reaction.

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CHEM 201 Student Help will be available in the Math & Stats Learning Center (MSLC) located on the third floor of Love Library in room LL328 or online through Zoom. The MSLC will have chemistry tutors as well as TA help hours to help with homework, labs, etc. A schedule of chemistry tutors is available through [MSLC Link](#). A schedule for TA office hours at the MSLC will be made available in Canvas at the end of the first week of the semester. Don't hesitate to attend Dr. Byk office hours with any questions or other concerns you may have regarding the course.

Accommodations (SASC):

SDSU via the [Student Ability Success Center](#) (SASC) provides accommodations for students with documented disabilities or medical conditions covered under the Americans with Disabilities Act (ADA). In keeping with current public health guidance, no accommodations will be granted to students without an ADA-qualified disability or medical condition.

If you are a student with a disability and are in need of accommodations for this class, please contact the Student Ability Success Center at [SASC Link](#) or tac.sasc@sdsu.edu as soon as possible. Please know accommodations are not retroactive, and I cannot provide accommodations based upon disability until I have received an accommodation letter from the Student Ability Success Center. SASC registration and accommodation approvals may take up to 10-14 business days, so please plan accordingly.

Email Policy: Students are provided with an SDSU Gmail account, and this [SDSU email address](#) will be used for all communications. Per University Senate policy, students are responsible for checking their official university email once per day during the academic term. For more information, please see [Student Official Email Address Use Policy here](#).

All communication regarding this course should occur through official SDSU email accounts. The course instructor and lab coordinator will be available via email to answer questions or to schedule office hour appointments. Please allow at least 24 hours for

a response, longer over weekends and holidays. To ensure a prompt response include CHEM 201 in the subject line of your emails and make sure to provide your full name and lab section.

Away Games and Competition for SDSU Athletes

If you are an SDSU Athlete, send your schedule of competition to the lab coordinator, lclare@sdsu.edu. Accommodations will be made to make up assignments because of scheduled games or competitions. This accommodation does not apply to students in athletic clubs. Please have your coach email your Spring event schedule to the lab coordinator within the first two weeks of class.

Religious Observances

According to the University Policy File, students should notify instructors of planned absences for religious observances by the end of the second week of classes. Contact the coordinator: lclare@sdsu.edu

Preferred Names & Pronouns: Any student who wishes to be addressed by a name other than what is presented in Canvas is encouraged to contact the lab coordinator, (lclare@sdsu.edu) with the name you wish to use. Similarly, if you have preferred pronouns that you wish to be addressed by, please contact the coordinator. The coordinator will communicate your desires to the TAs and all instructional staff will gladly honor your request.

Finding Help on Campus:

Need help finding help -- an advisor, tutoring, counselling, or emergency economic assistance? The [SDSU Student Success Help Desk](#) is here for you. Student assistants are available via Zoom Monday through Friday, 9:00 AM to 4:30 PM to help you find the office or service that can best assist with your particular questions or concerns.

Suggested: Consider adding a link to your college's Student Success Center or your department's tutoring center or supplementary instruction activities.

- CAL Student Success Center: <https://cal.sdsu.edu/academics/student-success>
- College of Education Student Success Center: <https://education.sdsu.edu/oss>
- Center for Student Success in Engineering: <https://csse.sdsu.edu/advising/advising>
- CoS Student Success Center: <https://cossuccess.sdsu.edu/>
- FSB Student Success Center: <https://business.sdsu.edu/undergrad/advising>
- HHS Advisors: <https://chhs.sdsu.edu/academics/advising>
- IVC Student Success and Retention: <https://imperialvalley.sdsu.edu/about/departments/student-affairs/retention>
- PSFA Advisors: https://psfa.sdsu.edu/resources/student_advisors
- Math & Science Learning Center: <https://mslc.sdsu.edu/>

Sexual violence / Title IX mandated reporting: As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I am a mandated reporter in my role as an SDSU employee. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the greatest extent possible. However, I am required to share information regarding sexual violence on SDSU's campus with the Title IX coordinator, Jessica Rentto 619-594-6017. She (or her designee) will contact you to let you know about accommodations and support services at SDSU and possibilities for holding accountable the person who harmed you. Know that you will not be forced to share information you do not wish to disclose, and your level of involvement will be your choice. If you do not want the Title IX Officer notified, instead of disclosing this information to your instructor, you can speak confidentially with the following people on campus and in the community. They can connect you with support services and discuss options for pursuing a University or criminal investigation. Sexual Violence Victim Advocate 619-594-0210 or Counseling and Psychological Services 619-594-5220, psycserv@sdsu.edu. For more information regarding your university rights and options as a survivor of sexual misconduct or sexual violence, please visit titleix.sdsu.edu or sdsutalks.sdsu.edu.

The [Family Educational Rights and Privacy Act](#) (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. I will not post grades or leave graded assignments in public places. Students will be notified at the time of an assignment if copies of student work will be retained beyond the end of the semester or used as examples for future students or the wider public.

COVID-19 Protocols

Vaccination and testing protocols set by the CSU and SDSU will be enforced. Make sure to upload proof of your COVID-19 booster shot to [Healthconnect](#). For more information use the following link: <https://sacd.sdsu.edu/student-health-services/covid-19>. If you experience COVID symptoms seek immediate testing at Student Health Services or pick-up a rapid test at one of the on campus vending machines

SDSU Economic Crisis Response Team:

If you or a friend are experiencing food or housing insecurity, technology concerns, or any unforeseen financial crisis, it is easy to get help! Visit <https://sacd.sdsu.edu/ecrt> for more information or to submit a request for assistance. SDSU's Economic Crisis Response Team (ECRT) aims to bridge the gap in resources for students experiencing immediate food, housing, or unforeseen financial crises that impacts student success. Using a holistic approach to well-being, ECRT supports students through crisis by leveraging a campus-wide collaboration that utilizes on and off-campus partnerships and provides direct referrals based on each student's unique circumstances. ECRT empowers students to identify and access long term, sustainable solutions in an effort to successfully graduate from SDSU. Within 24 to 72 hours of submitting a referral, students are contacted by the ECRT Coordinator and are quickly connected to the appropriate resources and services.

For students who need assistance accessing technology for their classes, visit our ECRT website <https://sacd.sdsu.edu/ecrt> to be connected with the SDSU library's technology checkout program. The technology checkout program is available to both SDSU and Imperial Valley students.

Help control the COVID-19 pandemic:

Addressing the COVID- 19 pandemic is a shared responsibility. The California State University System mandates that students, faculty and staff receive a full COVID-19 vaccination to be on campus. Do not come to campus if you do not feel well. Remain home and monitor your symptoms and seek medical attention as needed. If you receive a positive COVID-19 test, complete the [COVID-19 Reporting Form](#). For more information on vaccination and face covering compliance please visit <https://sacd.sdsu.edu/student-rights/covid-policies>

Contact the lab coordinator if you will be absent from a lab session. If students need assistance purchasing facial coverings, please contact the [Economic Crisis Response Team](#).

consent, communicate with the student's instructors via the Vice President for Student Affairs and Campus Diversity and may communicate with the student's Assistant Dean and/or the [Student Ability Success Center](#).

Land Acknowledgement:

We stand upon a land that carries the footsteps of millennia of Kumeyaay people. They are a people whose traditional lifeways intertwine with a worldview of earth and sky in a community of living beings. This land is part of a relationship that has nourished, healed, protected, and embraced the Kumeyaay people to the present day. It is part of a world view founded in the harmony of the cycles of the sky and balance in the forces of life. For the Kumeyaay, red and black represent the balance of those forces that provide for harmony within our bodies as well as the world around us. As students, faculty, staff and alumni of San Diego State University we acknowledge this legacy from the Kumeyaay. We promote this balance in life as we pursue our goals of knowledge and understanding. We find inspiration in the Kumeyaay spirit to open our minds and hearts. It is the legacy of the red and black. It is the land of the Kumeyaay.

Spring Schedule

Week # and Dates	Lecture Monday	Recitation Mon/Tues	Lecture Wednesday	Lab Wed/Thurs	Lecture Friday
#1 Jan 16– Jan 20			Introduction to Class	No Labs	Chap. 8 - Review of Lewis Structures of Main Group Inorganic
#2 Jan 23 - Jan 27	Chap. 8 - Review of Formal Charge and Resonance; VSEPR	Ion Quiz	Chap. 8 – Review of Lewis Structures of Organic Compds; Drawing 3D Structures of Organic Compds	Lab And Safety Introduction Ion Test - 2nd try	Chap. 3-4 - Review of Basic Reaction; Stoichiometry; Limiting Reagents
#3 Jan 30- Feb 3	Chap. 15 - Equilibrium Basics; Equilibrium Constants	Quiz 1 Add/Drop deadline at 11:59 pm Jan 31	Chap. 15 - Le Chatelier's Principle; Factors Affecting Equilibrium	Locker Check-in Pipetting Exercise Experiment 1 - Introduction to the Spectrophotometer	Chap. 16 - Bronsted Acids and Bases; Conjugate Acid/Base Pairs; pH and pOH
#4 Feb 6 - Feb 10	Chap. 16 – Strong Acids and Bases	Quiz 2	Chap. 16 – Weak Acid and Bases	Experiment 3 - K_a and K_b <i>Exp. 1 report due</i>	Chap. 16 – Molecular Structure and Acid Strength
#5 Feb 13 - Feb 17	Chap. 16 – Hydrolysis of Salts	Quiz 3	Review for Exam 1	Mg group unknown <i>Exp. 3 report due</i>	Exam 1 OWL Homework for midterm 1 due Feb 19 at 11:55 pm

Week # and Dates	Lecture Monday	Recitation Mon/Tues	Lecture Wednesday	Lab Wed/Thurs	Lecture Friday
#6 Feb. 20 – Feb 24	Chap. 17 - Buffers	Worksheet 1	Chap. 17 - Buffers	AI group unknown	Chap. 17 – Titrations of Strong Acids and Bases
#7 Feb. 27 - Mar. 3	Chap. 17 – Titrations of Weak Acids and Bases	Quiz 4	Chap. 17 - Solubility Equilibria; Factors Affecting Solubility	Experiment 4 - pH titration	Chap. 17 - Precipitation Reactions; Qual. Scheme
#8 Mar. 6 - Mar. 10	Chap. 17 - Complex ions formation	Quiz 5	Chap. 18 – 1 st Law of Thermodynamics; Enthalpy and Entropy	Experiment 5 - Formation Constants <i>Exp.4 report due</i>	Chap. 18 – 2 nd and 3 ^d Laws of Thermodynamics; Standard Entropies
#9 Mar. 13 - Mar. 17	Chap. 18 - Gibbs Free Energy and Spontaneity	Quiz 6	Review for Exam 2	General Unknown <i>Exp.5 report due</i>	Exam 2 OWL Homework for midterm 2 due March 19 at 11:55 pm.
#10 Mar. 20 - Mar. 24	Chap. 18 - Free Energy and Equilibrium	Worksheet 2	Chap. 19 – Balancing Oxidation and Reduction Rxns	General Unknown	Chap. 19 – Electrochemical Cells; Cell Potential; Standard Electrode Potentials

Week # and Dates	Lecture Monday	Recitation Mon/Tues	Lecture Wednesday	Lab Wed/Thurs	Lecture Friday
#11 Mar. 27 - Mar. 31	Spring Break	Spring Break	Spring Break	Spring Break	Spring Break
#12 Apr. 3 - Apr. 7	Chap. 19 - Cell Potential, Free Energy, and Equilibrium; Nernst Equation	Quiz 7	Chap. 19 - Concentration Cells; Redox Rxns Applications	General Unknown	Chap. 14 - Chemical Reaction Rates; Factors Affecting Reaction Rates
#13 Apr. 10 - Apr. 14	Chap. 14 - Rate Laws	Quiz 8	Chap. 14 - Integrated Rate Laws	Experiment 6 Echem Cells <i>Gen Unk report due</i>	Chap. 14 – Psuedo Order Kinetics; Arrhenius Eqn
#14 Apr. 17 - Apr. 21	Chap. 14 – Collision Theory; Molecular Interpretation of Factors Affecting Rate	Worksheet 3	Chap. 14 - Reaction Mechanisms	Experiment 7 Kinetics <i>Exp.6 report due</i> (Last Day of Lab)	Chap. 14 - Catalysis
#15 Apr. 24 – Apr 28	Chap. 25 - Radioactivity and Nuclear Reactions	Quiz 9	Review for Exam 3	Locker Check Out	Exam 3
#16 May 1 - May 5	Chap. 25 – Kinetics of Radioactive Decay; Energy of Nuclear Reactions; Nuclear Chemistry Applications	Worksheet 4	Review for Final Exam	<i>Exp.7 report due</i> Last Day of Class	OWL Homework for midterm 3 includes all of Chapter 25 and is due May 10 at 11:59 pm.

FINAL EXAM, May 10 (Wednesday), 1:00 – 3:00 PM