CHEM 23B PO: DISCOVERING CHEMISTRY W/ LABORATORY

INSTRUCTORS

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OFFICE HOURS & HOMEWORK SESSIONS

Liu: Mondays 9-11 am; Tuesdays 1:30-3:30 pm; by appointment

Muzikar: Mondays and Wednesdays 11 am-12 pm; by appointment

O'Leary: Mondays, Wednesdays, and Fridays 10 am - 12 pm; drop-ins welcome

Homework Sessions: To Be Determined

LOGISTICS

Course meeting times: Tuesdays and Thursdays, 9:35-10:50 am (SC 103);
Thursdays or Fridays, 1:15-5 pm (SC 103 and SN 007)

Website: We will use Sakai to post all course materials, including syllabus, class activities, class slides, and homework assignments. Login with Pomona user ID and password.

WELCOME TO DISCOVERING CHEMISTRY!

We are so glad that you are here. We want our classroom to be inclusive, equitable, and full of participation. As your instructors, we are committed to creating a classroom environment that welcomes and supports all students, regardless of race, gender, religious beliefs, etc. No matter where you're starting out, we are committed to helping you succeed in this class. We expect that your unique background will enrich our learning environment and we are excited to have you in this class. We all have implicit biases, and we strive to continually examine our judgments, words, and actions to keep our biases in check and treat everyone fairly. We expect that you will do the same and that you will let us know if there is anything we can do to make sure everyone is successful in this class. If there are any aspects of the instruction or design of the course that result in barriers to your learning, please let us know as soon as possible. If you do not feel comfortable approaching us directly, please feel free to reach out to: Zheous Abalos, Elizabeth Sohn, or Heidi Xu.

It is common that college students experience a great deal of stress. In a class of this size, there will likely be a few individuals who are going through hard times and who are experiencing psychological difficulties. If you are feeling miserable, or you think you are experiencing psychological problems, please do seek help! If you think you may benefit from psychological help, please consider reaching out to Monsour Counseling and Psychological Services (MCAPS), 909-621-8202. You may also use TimelyMD which provides 24/7 free and unlimited medical and mental health services. To register and access this service, please visit: https://timelycare.com/schools/index.php?school=7chealth&.

Our goals are that CHEM 23 students will leave the course:

- **Energized to take more science courses and feel confident in their ability to do so, and**
- **Ready and confident to join collaborative research projects.**

This foundational foray into the field of chemistry will provide a foundation for advanced study in the chemical sciences and related fields. We hope that through this course you will also gain a general appreciation for the molecular nature of our world and how scientific research is done. We aim to foster an environment that produces a cohort of active learners who are intentional about their educational choices.

After successfully completing the entire CHEM 23 sequence, students will be able to:

- Engage in accurate communication about chemistry through prose, equations, figures, tables and graphs;
- Develop conceptual models and hypotheses from observed chemical data and phenomena;
- Synthesize knowledge to solve complex chemistry problems;
- Ask good questions and have developed intuition for seeking realistic answers;
- Explain and discuss the historical (and continuing) power and identity imbalances within the field(s) of chemistry;
- Provide examples of where chemistry helped to solve major crises and the flip side, where chemistry as a field created major crises.

In addition, active engagement with the course will allow students to increase skills such as: communication of scientific concepts and experimental results; managing group dynamics and using teamwork for effective collaboration; self-management and self-assessment.

For the **laboratory portion** of CHEM 23B, students will engage in a **CURE** that aims to created *aptamers* for a range of *small molecules* that can then be applied as *biosensors*. Currently, the research projects are all focused on better understanding the parameters that impact aptamer selection during the *Capture-SELEX method* (aka structure-switching method). By engaging in this research, students will be able to:

- Develop skills and knowledge needed to complete research in the realm of biochemistry / chemical biology;
    - Specific technical knowledge gained will involve making solutions, including buffers; UV-vis spectroscopy; PCR, gel electrophoresis; the use of MW cutoffs; SELEX; titration
- Iterate a given protocol in order execute, trouble-shoot, and/or optimize an experiment;
- Practice making and defending decisions during experimentation (e.g., when trouble-shooting or determining whether an experiment is proceeding as intended);
- Communicate about research progress (purpose, methods, results, take-aways) orally and in writing (this includes keeping good records);
- Learn how to be an engaged member of a research team.

Note that many of the intended learning outcomes above are applicable outside of chemistry! Being able to ask questions, synthesize knowledge, interpret data – these are all foundational skills that will allow you to be creative and critical thinkers in any field you apply yourself to.

For each class period, a list of **specific learning outcomes** will be provided to you, so that you can gauge your mastery of the materials and skills covered in CHEM 23.

What is a CURE? Course-based undergraduate research experiences (CUREs) provide an alternative to the apprenticeship model for high impact research immersion experiences. CUREs promote some of the same key learning outcomes as apprenticeships, including building knowledge and skills, while increasing STEM retention and success. Unlike most apprenticeships, however, CUREs are integrated into the curriculum and, therefore, deliver research immersion experiences in a structure that promotes inclusivity.

There are five key elements of CUREs: 1) use of ***scientific practices***, 2) focus on ***discovery***, 3) focus on ***broadly relevant*** or important work, 4) ***collaboration***, and 5) ***iteration*** (Auchincloss *et al.*, 2014). The first element, *use of scientific practices* such as formulation of research questions and models, nuanced data analysis and scientific communication (Brownell & Kloser, 2015), allows students to experience research as more than only data analysis and helps frame the entire CURE. These practices are focused on *discovery* of novel findings that have *broad relevance or importance* to the wider scientific community. This reinforces *collaboration*, both within the classroom and in dialogue with the wider community. Scientific discovery is an iterative process; new knowledge is scaffolded upon existing knowledge. Thus, the final element of the CURE is *iteration*. Students build on knowledge from the literature, prior semesters' projects, and/or from their own series of attempts to pursue an experimental question. Students interpret outcomes of the experimentation and draw conclusions from their results, and then propose new processes for gaining a better understanding of the problems investigated in these CUREs.

COURSE MATERIALS

- **Textbook:** OpenStax Atoms First, 2nd edition: https://openstax.org/details/books/chemistry-atoms-first-2e. This is a free, online textbook. You can also get a print version – hardcover ISBN: 978-1-94717-264-7, softcover ISBN: 978-1-59399-579-9.
- **Homework:** We will use Aktiv Learning for online homework. The College is covering the costs of this resource, and it links directly with your online textbook. See Sakai for information on how to enroll in Aktiv Learning. The enrollment code for this CHEM 23B is **NQLUMC**.
- **Additional Resources**: You will routinely need access to a calculator during class time. You will need access to a smartphone, tablet, or computer to access Sakai, Google Docs, and Aktiv Learning.
- **Email policy:** We will email the class frequently. You are expected to check your Pomona email account for these emails and to read them. Email is also the best way to get ahold of the instructors for the course.

COURSE OVERVIEW

Co-Instructor Model: Letting one of us know something is like letting all of us know. If you do prefer to share something with only one of us, however, we would do our best to respect your wishes.

Your Tasks

Before class: ***Do initial reading assignments and any assigned activities*** (e.g., watch a video, look at a website) before class. These assignments will allow you to be ready for the start of class – your preparation will form part of your participation grade.

In class: ***Engage content in class – through discussion and problem solving – to achieve learning gains.*** **Your attention and focus during the class time should be on the activities going on in the class – please refrain using your digital devices for non-course work.** The in-class work aims to maximize your learning while also developing important skills such as communication, teamwork, management, and self-assessment. During our class meeting time, you will function as a member of a Learning Team, examining chemistry concepts as a unit. Working as a team is also reflective of how science is done – in research groups, through collaboration, etc. Team responses to key questions on in-class activities will be evaluated for correctness and effective communication. The team may also strategize on ways to improve teamwork and team products. Your team effort and these responses are part of your participation grade. Throughout the semester, you may be asked to assess yourself and your teammates. Evaluations will be based on the Team Performance Rubric, which can be found on the course Sakai site (in the Teams folder). You should refer to this rubric throughout the semester to make sure you are fulfilling the criteria of being a productive team.

In laboratory: ***Actively engage in the research process to achieve learning gains.*** Engagement in laboratory research relies on purposeful learning, self-direction, teamwork, and problem solving. After every laboratory period, your active engagement in research will be assessed by self-assessment, your

teammates, and/or your instructor(s). The Engagement in Laboratory Research rubric will be used. You should refer to this rubric throughout the semester to make sure you are fulfilling the criteria of active engagement in lab.

If you miss a laboratory period, then you will receive a "Red" for that week. Your two lowest laboratory engagement scores will be dropped at the end of the semester. In addition, your notebook and team presentations during in-class group meeting will be assessed (see rubrics on Sakai). In all cases, you will be scored on a Green – Yellow – Red basis.

> Nearly all "greens" in one area (engagement, notebook, or presentations) represents excellent, A-level work.
>
> A mixture of 10-20% yellows, with the remainder as greens represent very good, B-level work.
>
> A mixture of 20-30% yellows, with the remainder as greens represent developing, C-level work.
>
> More than 30% yellows or more than 10% red represents novice D-level work.
>
> More than 40% yellows or more than 20% red represents incomplete and insufficient work.

After class: ***Actively*** work on questions stemming from the reading and in-class work. This will bring your learning full circle. The key to learning any new skills or concepts is to practice. The point of the assigned homework and optional problems is to give you that practice. "Actively working" means that you work out the problems yourself – you do not simply watch someone else tackle the problem. At the same time, you can (and should!) do your practice with others – it is a chance for you to practice communicating to and learning from others. We provide two sources of practice for you:

- ***Aktiv Learning - Homework:*** The electronic homework is designed to enhance your learning in conjunction with the text. **A set of questions, related to material covered in class, is due every Monday at noon**. In the Spring semester, there are 13 Aktiv homework assignments. You must complete all 13, but we will only count the 12 highest scores in your final grade.

  Due date extension policy: We expect work to be turned in by the communicated due dates, which were all decided with careful consideration of all the assignments throughout the semester, along with assignments and exams in other courses that students are commonly cross-enrolled in. Learning to manage due dates and multiple responsibilities will also be helpful for future jobs and internships. However, we recognize that the only thing that one can really expect in life is the unexpected. Thus, in this class, you each will have **two** "**Flex Tokens**". Application of the Flex Token allows you to receive a no-questions-asked deadline extension. By 11:59 pm the night before the original due date, you must communicate your use of the Flex Token by using the Google Form (link also available on Sakai) to receive an extension. Questions about Flex Tokens can be addressed to Prof. Liu.

  When Flex Tokens are not used, **late work will be accepted** for all homework. However, for every day that the assignment is tardy, a 10% deduction will be applied to your grade on that assignment.

- ***Aktiv Learning – Optional Problems:*** For each week, additional problems will be suggested. These additional problems will often form part of the Discovery Check-ins (see below).

Get Help!

One of the most crucial elements of a positive CHEM 23 experience is developing efficient, effective study habits and spending dedicated time practicing what you have learned throughout the week. But this is not something you need to do alone! There are lots of opportunities for you to get help with your learning.

Homework Sessions: We have a Quantitative Skills Center (QSC) Partner to help guide your learning. The Partner is a handpicked peer who is committed to helping you succeed in this course. The Partner also serves as a liaison to the instructors as needed. The Partners will host a Homework Session – time in a designated space where you can join your classmates to work on the course work and deepen your learning. The Partners also meets one-on-one with students to provide course specific help.

The QSC also offers non-course specific help in general quantitative skills and offers consultations for projects and theses involving quantitative methods. To make an appointment with a Partner or to reach out to the QSC, please visit pomona.mywconline.com, or write to qsc@pomona.edu. The QSC is in SCC (Smith Campus Center) 228.

Office Hours: These are guaranteed times when we can individually be found in our offices, ready and waiting for you to come by. You can come by with specific questions. Lots of students do this: they've organized their class notes, homework, etc. and they bring those documents with them and ask us specific questions. Some students take notes while we chat. Examples of specific questions you might ask:

I didn't understand XX when we talked about it in class. Can we go over it again?

I don't understand how to start this problem on the homework. Can you help me get started?

I don't understand what this paragraph in the textbook means. What should I be thinking about?

I know we talked about this already, but I am still struggling with this concept. Can you help me again?

If you do not have a specific question, you can still go to office hours! It may help if you have at least a starting point for the conversation. Some things you might say are:

So…. Orbitals….. Yeah. Tell me about that.

I haven't started the homework yet, but I thought I could do that now, with you here to help me.

High school chemistry was really hard for me. So, I'm scared.

I want to do well in this class. What should I do?

If you do not have a specific question and you do not have a starting point for the conversation, that is OK too! By just chatting with us about the course, questions will surely evolve.

Assessments

Final Grade Calculation		Grading Scale			
Class Participation:	10%	A	93-100	C	73-76
Homework (best 12 of 13):	15%	A-	90-92	C-	70-72
Discovery Check-ins (best 3 of 4)*:	20%	B+	87-89	D+	67-69
Mastery quizzes:	10%	B	83-86	D	63-66
Laboratory engagement:	25%	B-	80-82	D-	60-62
Laboratory notebook:	10%	C+	77-79	F	≤59
Laboratory presentations:	10%				

There is no curve for this course – you need only worry about your own performance. Please note that an "A" grade represents excellent mastery and astute discussion of concepts covered in this course.

How to think about your grade: Think about it like a video game. You are starting with zero points in the class, and you are working to earn as many as you can to get a max score. We are not taking points away from you when you get a grade – we are adding points to your total that you have earned.

Discovery Check-ins: There will be two check-ins during the first part of the semester to assess your learning on the new material covered in the course. A final check-in will take place during finals week (Tuesday, May 7, 2-5 pm) and is the equivalent of two check-ins. The check-ins will all be cumulative and be comprised of short answer questions based on material from in-class activities, assigned homework, and the optional problems. For each check-in, you may use a calculator as well as one page (front-and-back) of hand-written notes. The check-ins will focus on assessing your ability to apply what you have learned and not rote memorization.

*Mastery of 23A Material: The material we covered in CHEM 23A is relevant to CHEM 23B, and important for any future work you will do in chemistry. We expect a certain degree of mastery on 23A

topics to pass 23B. Based on your final check-ins from 23A, we may ask you to continue to review material from 23A and demonstrate mastery of concepts by the end of 23B. The final check-in for 23B will be cumulative across both semesters.

Answer keys: will be available on the course Sakai site shortly after the graded check-ins have been returned. These keys cannot be downloaded (the professors want to maintain some control over their materials) but are available for you to view during the semester. If you want to re-take a check-in for practice, we encourage you to use your returned check-ins and cover up your previous answers with a piece of paper and re-work problems. You can also handwrite questions from electronic check-ins onto a piece of paper (a valuable way to wrap your mind around the problem!) and work the problems that way.

Check-in Retakes. If you score less than 75% on any of the first two check-ins, you will have the opportunity to re-take that check-in to score up to 75%. One re-take is permitted per check-in. There will be a designated Check-in Retake Day. On those days, during designated hours, students can re-take any check-in that they scored <75% on. One week before these Retake Days, you must communicate with Prof. O'Leary which check-ins you plan to retake.

Make-up Check-ins. Please notify us of conflicts as soon as possible, preferably two weeks, but no later than one week, before the scheduled check-in. For verified extenuating circumstances, any student who misses a re-take will have the opportunity to make-up that check-in during a Retake Day. Post-check-in makeups are not eligible for a retake.

Mastery Quizzes: Throughout this semester we will continue to review – and rely on – the foundational content we covered in 23A. To continue to gauge your mastery of that material, you will be expected to pass (90% or above) 4 mastery quizzes (Communication and Counting; Bonding and Structure; Equilibria, Acids & Bases, Solubility, Formation; Energy) that will be administered through Aktiv. You will have up to 3 attempts per quiz. Once you score ≥90% on all 4 quizzes, you will receive the full 10% of points toward Mastery Quizzes. Anyone who does not score ≥90% on all 4 quizzes will receive a 0 on Mastery Quizzes. Questions about Mastery Quizzes may be directed to Prof. O'Leary.

Participation: This course is designed for you to come to class and participate. That being said, life happens. We have designed assignments and assessments so that you can miss a certain number without affecting your grade. During class time, in addition to mastering the material yourself, you are responsible for assisting the other members of your team in their understanding of the material. Please be respectful of us and your fellow classmates and show up to class on time. You may miss three Tuesday and Thursday classes and two Thursday / Friday laboratory sessions without an excuse for the semester – your participation grade will not be negatively impacted in these cases. All materials from class will be posted on the course Sakai site. **You are responsible for handing in all assignments on time and obtaining all activities, regardless of missed classes.**

If you miss a class because of illness, you do not need a note unless you have already missed more than three Tuesday/Thursday classes and two Thursday/Friday laboratory sessions. If you are having a lot of difficult coming to class, eating, sleeping, or generally functioning, we will reach out to the Dean of Students to ask them to help you. We want you to be able to earn points and a grade based on your ability to do chemistry – not based on something out of your control. That would not be fair, and fairness is very important to us.

Grading Policy: Any query regarding scores on graded assignments or exams should be presented within three days of return of the assignment/exam. It is your responsibility to meet with one of us to make any adjustments. Please note that we reserve the right to regrade the entire submission, and as a result, we may raise or lower your entire score. After three days, all scores become final and unalterable.

Special circumstances: If there are special circumstances, such as illness of other form of emergency, which should be considered regarding any of the stated class policies, please inform us as soon as possible so that alternative arrangements can be made.

Accommodations: Pomona College is committed to making all courses accessible for everyone. We encourage you to meet with Prof. Muzikar early in the semester to discuss your Accessibility Resources and Services (ARS) authorized accommodation needs for this course. If you need academic

accommodations or have any questions about the accommodations procedure, please contact ARS in the Dean of Students office at disability@pomona.edu or 909-621-8017.

Religious Observances Policy: Our community is strengthened by our great diversity, including various religious and spiritual identities. If you have religious accommodation needs, with respect to specific religious holidays that will affect class attendance and participation, remember the structure of the course is set up to provide flexibility for such instances. You are also welcome to speak to Prof. Liu about your needs. For further advice and consideration, please reach out to the chaplains' office, chaplains@claremont.edu.

Academic ethics and integrity policy: It is important that you develop the ability to work independently as well as the ability to problem-solve with others. We want you to learn how to collaborate with others and at the same time develop your own deep understanding of the course material. Any work that you turn in for a grade should be your own work, written by you. You are expected to abide by the Pomona College Standards of Academic Integrity. For the official policy go to: https://catalog.pomona.edu/content.php?catoid=46&navoid=9114. Anyone found responsible for violating the College's Academic Honesty Policy will receive a failing grade on that assignment and the Dean of the Students will be notified in accordance with policy.

PUBLIC HEALTH

The College has guidelines in place to protect public health. In our class specifically, if you are required to wear a mask, we will gently remind you to do so. These guidelines may change during the semester to reflect changing conditions and knowledge; we will let you know if this happens. If you forget your mask, ask us, we may have one for you. If a student is unwilling to do their part to preserve public health in in-person classes, then we will ask them to leave the class. As in class participation is a major part of the class, this could affect your grade in the class.

What do to if you are not feeling well: One of the most important things you can do is to stay home if you are sick. We often have a culture of trying to "push through" when we are not feeling well, saying things like, "Yeah, I am sick, but I will be OK – I can still go to class". While this sort of perseverance in general is a good thing, coming to class when you are sick puts other people's health at risk. So, if you have any symptoms at all, stay home. Again, the structure of the course is set up to provide flexibility for such instances.

What to do if you are seriously ill. If you have an illness or injury that interferes with your ability to do working our class, talk to us! The Accessibility Resources and Services (ARS) office helps students with short-term injuries and illnesses – concussions, broken bones, etc. Please know that you can also always reach out to your class dean for support in navigating these challenges. If you are sick or hurt, we will work with you and with ARS and/ or your class dean to do whatever we can to accommodate your condition.

INCLUSION

Everyone is this class is an equally valued member of this college and our community. We expect you to treat your classmates as honored colleagues in the collective endeavor we are all involved in – to understand the chemical world and use that understanding to improve our society.

Bias against or denigration of anyone in our class because of their gender or how they express it, their sexual orientation, their religion, their national origin, their race or ethnicity, or a disability they may have will not be tolerated. If you are the target of this sort of bias or if you witness it, please report it directly to us and we will take swift action. If you don't feel comfortable talking to us, you may report it anonymously to the course QSC Partners.

SOME FINAL THOUGHTS

We expect that you are committed to doing the work to understand the material in this course. We also expect that the level of work each person needs to commit for each part will vary person-to-person and topic-to-topic. Our role is to act as your coaches to guide you in your learning. Ultimately, the learning process belongs to you alone. Consider your learning much like how you would learn a new physical

skill, such as shooting hoops, playing an instrument, or a new dance move. You should practice on your own and you can self-assess your progress. We will help you, but we cannot do it for you. Some additional things to keep in mind:

Learning requires practice. To become a master at something, you need to practice it for 10,000 hours. For most chemistry courses, we would expect you to practice, on average, 10 hours a week.

Learning involves failure. There is no problem with trying and failing, as long as you learn something. In fact, in science, your goal is often to test a model, theory, or hypothesis, and try to get it to FAIL. When it fails, and how it fails, teaches us something. Thus, as scientists, we strive for failure. We do not work to "prove" anything. Some people get caught up in failure, success, grades, being a hero, but in science, there is really no such thing. So, be brave, try your best, failure is just nature's way of telling us what is real and true.

Science, learning, and teaching are all cumulative. In fact, the structure of our entire chemistry curriculum is set up to build one class on top of the other. Our curriculum is iterative, much like real science, so you will also see several topics several times in new contexts and with new jargon and concepts attached.

Science is collaborative. Scientists do not work alone, and they do not work in a vacuum. They work with others. You are in teams in this class because learning to collaborate is an essential element to learning and doing science.

Science is creative. Science is often taught as having "right" and "wrong" answers. For those of you who like this aspect of science (the ability to be right), there is good news and bad news. The good news: your homework problems will still have a right answer. The bad news: cutting edge science may not. This is where a lot of scientific ingenuity and creativity come into play.

We are really excited about teaching you in this course. We endeavor to do things in the class to help you struggle well, so that you learn. That is the most important part for us – that you learn. We are here to coach you. Also, we are admittedly human, so if we make a mistake, please let us know (with kindness). We are looking forward to working with you all!

Aspects of this syllabus were adapted from Jenny Ross's Introductory Physics syllabus, Syracuse University, and Christine Broussard's Immunology Lab syllabus, U. La Verne.

Calendar (Subject to Change)

SUNDAY	MONDAY	TUESDAY	WEDNES.	THURS.	FRIDAY	SAT.
14 WEEK 1	15	16 *(CLASS 1)* FIRST DAY OF CLASS	17	18 *(2)* *DL 1*	19 *DL 1*	20
21 WEEK 2	22 HW DUE, NOON	23 *(3)*	24	25 *(4)* CHECK-IN *DL 2*	26 *DL 2*	27
28 WEEK 3	29 HW DUE, NOON	30 *(5)*	31	FEB 1 *(6)* *DL 3*	2 *DL 3*	3
4 WEEK 4	5 HW DUE, NOON	6 *(7)*	7	8 *(8)* *DL 4*	9 *DL 4*	10
11 WEEK 5	12 HW DUE, NOON	13 *(9)*	14	15 *(10)* *DL 5*	16 *DL 5*	17
18 WEEK 6	19 HW DUE, NOON	20 *(11)*	21	22 *(12)* CHECK-IN *DL 6*	23 *DL 6*	24
25 WEEK 7	26 HW DUE, NOON	27 *(13)*	28	29 *(14)* RETAKE DAY *DL 7*	MAR 1 *DL 7*	2
3 WEEK 8	4 HW DUE, NOON	5 *(15)*	6	7 *(16)* LAST DAY TO DROP *DL 8*	8 *DL 8*	9
10	11 SPRING BREAK	12 SPRING BREAK	13 SPRING BREAK	14 SPRING BREAK	15 SPRING BREAK	16
17 WEEK 9	18 HW DUE, NOON	19 *(17)*	20	21 *(18)* *DL 9*	22 *DL 9*	23
24 WEEK 10	25 HW DUE, NOON	26 *(19)*	27	28 *(20)* *DL 10*	29	30
31 WEEK 11	APR 1 HW DUE, NOON	2 *(21)*	3	4 *(22)* *DL 11*	5 *DL 11*	6
7 WEEK 12	8 HW DUE, NOON	9 *(23)*	10	11 *(24)* *DL 12*	12 LAST DAY W *DL 12*	13
14 WEEK 13	15 HW DUE, NOON	16 *(25)*	17	18 *(26)* *DL 13*	19 *DL 13*	20
21 WEEK 14	22 HW DUE, NOON	23 *(27)*	24	25 *(28)* *DL 14*	26 *DL 14*	27
28 WEEK 15	29	30 *(29)* LAST DAY OF CLASS	MAY 1	2 READING DAY	3 READING DAY	4
5	6	7 FINAL CHECK-IN (2-5 PM)	8	9	10	11

Schedule (Subject to Change)

Week	(Class) Date	Unit/Topic	Atoms 1st Assigned Reading*
		Unit 6: Alternative Energy	
1	(1) 1/16	Welcome back! And Electrochemistry!	
1	(2) 1/18	Electrochemistry	16.1-16.5
1	1/18 or 19	**Discovery Lab 1: Research and Pipetting – Part 1**	
2	(3) 1/23	Alternative energy	20.1, 20.2, 20.4
2	(4) 1/25	**CHECK-IN – ELECTROCHEMISTRY**	
2	1/25 or 26	**Discovery Lab 2: Research and Pipetting – Part 2**	
3	(5) 1/30	Introduction to SELEX	See Sakai
3	(6) 2/1	Introduction to SELEX	See Sakai
3	2/1 or 2	**Discovery Lab 3: CURE**	
		Unit 7: HIV and Kinetics	
4	(7) 2/6	Introduction to HIV/AIDS & Chemical Reaction Rates	17.1
4	(8) 2/8	Factors Affecting Reaction Rates and Rate Laws	17.2, 17.3
4	2/8 or 9	**Discovery Lab 4: CURE**	
5	(9) 2/13	Integrated Rate Laws	17.4
5	(10) 2/15	Collision Theory & Reaction Mechanisms	17.5, 17.6
5	2/15 or 16	**Discovery Lab 5: CURE**	
6	(11) 2/20	Reaction Mechanisms (cont.), Catalysis, and Review	17.6, 17.7
6	(12) 2/22	**CHECK-IN – KINETICS**	
6	2/22 or 24	**Discovery Lab 6: CURE**	
7	(13) 2/27	How to give a group meeting presentation	See Sakai

7	(14) 2/29	**RE-TAKE DAY**	
7	2/29 or 3/1	**Discovery Lab 7: CURE**	
8	(15) 3/5	Group presentations	
8	(16) 3/7	Group presentations	
8	3/7 or 3/8	**Discovery Lab 8: CURE**	
	3/11 – 3/15	***Spring Break***	
		Weeks 9-14: Advanced Chemical Concepts + CURE	
9	(17) 3/19	Review of bonding	TBD
9	(18) 3/21	Advanced bonding	TBD
9	3/21 or 3/22	**Discovery Lab 9: CURE**	
10	(19) 3/26	Intermolecular forces / non-covalent interactions	TBD
10	(20) 3/28	Prepare for presentations	
10	3/28	**Discovery Lab 10: CURE**	
11	(21) 4/2	Group presentations	
11	(22) 4/4	Group presentations	
11	4/4 or 4/5	**Discovery Lab 11: CURE**	
12	(23) 4/9	Nucleic acids	TBD
12	(24) 4/11	CRISPR	TBD
12	4/11 or 4/12	**Discovery Lab 12: CURE**	
13	(25) 4/16	Statistics and significant figures	TBD
13	(26) 4/18	Prepare for presentations	
13	4/18 or 4/19	**Discovery Lab 13: CURE**	

14	(27) 4/23	Group presentations
14	(28) 4/25	Group presentations
14	4/25 or 4/26	**Discovery Lab 14: CURE**
15	(29) 4/30	**Last day of class**
16	5/7	**FINAL CHECK-IN (2-5 pm)**

*Assigned reading indicates book chapter (sections) that should be read prior to that day's class.